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Announcing

AGERITE SYRUP

A new general purpose anti-oxidant in liquid form.

Good for use in carbon black stocks and other dark colored goods.

Samples and technical literature now available.

R. T. VANDERBILT CO.

230 PARK AVENUE

New York, N. Y.

INDIA RUBBER WORLD

Published at 420 Lexington Avenue, New York, N. Y.

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Compounding Ingredients[1]

Compositions—Properties—Functions

ZINC oxide consumption by the rubber industry in the United States is approximately 50,000 tons yearly. Of this amount about 20,000 tons are employed to activate organic accelerators of vulcanization, and the remainder to enhance the physical properties of vulcanized rubber, as tensile reenforcement, high tear and abrasive resistance, and whiteness where great excellence of color is not essential.

Zinc oxide is marketed under brands indicating grades. It is produced either from spelter, metallic zinc, or direct from zinc ores. The oxide made from spelter is known as French process or Florence zinc oxide. American process zinc oxide is produced directly from ores.

The French process product is marketed in three grades: namely, white seal, characterized by brilliant whiteness, great volume, and extreme fineness; green seal, equal in whiteness to white seal, but less voluminous; and red seal, which is not so white or so fine as either white or green seal.

American process oxide is marketed in many grades on the basis of whiteness and freedom from lead and acid content. These are impurities present in zinc ores and, unless specially eliminated, exist also in American process oxides.

Zinc oxide free from acidity is faster curing than when acidity, sulphur trioxide equivalent, is present. The presence of small amounts of cadmium also slows the cure, The presence of lead tends to decrease brightness of cured white rubber, but is not detrimental in dark goods. Unity of size and particle size influence mixing zinc oxide with rubber and its reenforcing value in the product.

Zinc Oxides

Anaconda 352

CHEMICAL COMPOSITION. Pure lead free zinc oxide coated with 0.25% fatty acid to improve its dispersive quality.
SELLER. International Smelting & Refining Co., (Zinc Oxide Dept.)
APPLICATIONS. Tire carcass, insulated wire compounds, and high-grade white specialties.
PHYSICAL STATE. White powder. Fine particle size.
PROPERTIES. See data under Anaconda Green Seal 333.

Anaconda 570

CHEMICAL COMPOSITION. Pure lead free zinc oxide.
SELLER. International Smelting & Refining Co., (Zinc Oxide Dept.)
APPLICATIONS. General purpose rubber compounding.
PHYSICAL STATE. White powder. Average particle size.
PROPERTIES. See data under Anaconda Green Seal 333.

Anaconda 577

CHEMICAL COMPOSITION. Pure lead free zinc oxide.
SELLER. International Smelting & Refining Co., (Zinc Oxide Dept.)
APPLICATIONS. General compounding and accelerator activation.
PHYSICAL STATE. White powder. Fine particle size.
PROPERTIES. Fast curing. See data under Anaconda Green Seal 333.

Anaconda Green Seal 333

CHEMICAL COMPOSITION. Zinc oxide, French process.
SELLER. International Smelting & Refining Co., (Zinc Oxide Dept.)
APPLICATIONS. Tire carcass, insulated wire compounds, and high-grade white stocks.
PHYSICAL STATE. Very fine white powder.
PROPERTIES. Sp. gr., 5.66. Soluble in acids and strong alkalies. Very stable. Non-toxic. Disperses well. Laboratory control tests applied for chemical purity, fineness, particle size, rate of cure, and tensile properties in vulcanized rubber.
RELEVANT MATERIALS. Reacts with fatty acids in activation of most accelerators.
PURPOSE AND FUNCTION. Activator for nearly all accelerators. Pigment for white stocks and reenforcing effect on physical properties of stocks in general.
METHODS OF USE. Can be added in bulk in any dry mixing procedure or as a water paste in latex compounding.

Anaconda Red Seal 222

CHEMICAL COMPOSITION. Zinc oxide, French process.
SELLER. International Smelting & Refining Co., (Zinc Oxide Dept.)
APPLICATIONS. Specified in some special insulated wire formulae.

[1] Continued from INDIA RUBBER WORLD, Apr. 1, 1935, pp. 27-30.

PHYSICAL STATE. White powder. Premium grade.
PROPERTIES. See data under Anaconda Green Seal 333.

Anaconda U.S.P. 777

CHEMICAL COMPOSITION. Pure zinc oxide, French process.
SELLER. International Smelting & Refining Co., (Zinc Oxide Dept.)
APPLICATIONS. Surgical plasters and extra-special white rubber.
PHYSICAL STATE. White powder.
PROPERTIES. Meets all requirements of U.S.P. standard. See data under Anaconda Green Seal 333.

Anaconda White Seal 555

CHEMICAL COMPOSITION. Zinc oxide, French process.
SELLER. International Smelting & Refining Co., (Zinc Oxide Dept.)
APPLICATIONS. Tire carcass, insulated wire compounds, high-grade white stocks.
PHYSICAL STATE. White powder. Slightly finer and whiter than Green Seal 333. A premium grade due to extreme purity and color.
PROPERTIES. See data under Anaconda Green Seal 333.

Azo ZZZ-11

CHEMICAL COMPOSITION. Lead free product of the reaction of zinc vapor and oxygen of the air.
SELLER. American Zinc Sales Co.
APPLICATIONS. Permanent rubber white, activator of accelerators, and reenforcer of physical properties. Especially recommended where stiffness in rubber stocks is desired and tear resistance is a secondary factor.
PHYSICAL STATE. White powder of uniformly good color. Particle size, large acicular, and relatively free from fines.
PROPERTIES. Sp. gr., 5.60. Stable. Non-toxic. Slow curing type of oxide having an acidity of 0.15 to 0.18% as sulphur trioxide equivalent. Disperses well.
RELEVANT MATERIALS. Retards thiuram accelerators.
PURPOSE AND FUNCTION. Provides activation of accelerators, stiffness, and whiteness of product.
METHODS OF USE. Add directly to rubber.
VULCANIZATION. Slow curing.

Azo ZZZ-44

CHEMICAL COMPOSITION. Lead free product of the reaction of zinc vapor and oxygen of the air.
SELLER. American Zinc Sales Co.
APPLICATIONS. For general rubber compounding as permanent white, activator of accelerators, and reenforcer of physical properties.
PHYSICAL STATE. Brilliant white powder. Particle size, small uniform rounds of 0.22-micron.
PROPERTIES. Sp. gr., 5.60. Stable. Non-toxic. Slow curing type of oxide having acidity of 0.15 to 0.18% as sulphur trioxide equivalent. Disperses well.
RELEVANT MATERIALS. Retards thiuram accelerators. When large amounts of zinc oxide are used with the thiuram accelerators, Azo ZZZ-44 is not recommended.
PURPOSE AND FUNCTION. Produces smooth easily processed stocks. Excellent aging properties. Develops anti-scorch properties with thiuram and mercapto accelerators. Gives high resiliency and is desirable in heavy duty truck carcasses.
METHODS OF USE. Add directly to the rubber.
VULCANIZATION. Slow curing.

Azo ZZZ-55

CHEMICAL COMPOSITION. Lead and cadmium free. Product of the reaction of zinc vapor and oxygen of the air.
SELLER. American Zinc Sales Co.
APPLICATIONS. Permanent white soft rubber stocks.
PHYSICAL STATE. Brilliant white powder. Particle size, small uniform rounds of 0.22-micron. Slow type curing oxide having 0.08 to 0.12% as sulphur trioxide equivalent. Disperses well.
RELEVANT MATERIALS. Does not retard thiurams.
PURPOSE AND FUNCTION. May be used in large amounts in stocks accelerated with thiurams without retardation of cure because of the absence of cadmium.
METHODS OF USE. Add directly to the rubber.
VULCANIZATION. Slow curing.

Azo ZZZ-66

CHEMICAL COMPOSITION. Zinc oxide of high chemical purity. Product of the reaction of zinc vapor and oxygen of the air.
SELLER. American Zinc Sales Co.
APPLICATIONS. For use in insulated wire and packing stocks and where alkaline accelerators are used.
PHYSICAL STATE. Brilliant white powder. Particle size, rounds of 0.25-micron.
PROPERTIES. Sp. gr., 5.60. Stable. Non-toxic. Fast-curing-type oxide having only 0.01% as sulphur trioxide equivalent.
RELEVANT MATERIALS. Does not retard thiurams.
PURPOSE AND FUNCTION. The absence of water soluble salts gives proper electrical properties and prevents swelling.
METHODS OF USE. Add directly to the rubber.
VULCANIZATION. Fast curing.

Florence Green Seal-8

CHEMICAL COMPOSITION. High chemical purity. French process.
SELLER. The New Jersey Zinc Sales Co., Inc.
APPLICATIONS. Insulated wire, cable, surgical goods, etc.
PHYSICAL STATE. White powder especially selected for color and brightness. Average particle size, approximately 0.25-micron.
PROPERTIES. Sp. gr., 5.65. Non-toxic. Disperses well. High chemical purity. Low lead content. More dense than White Seal-7.
PURPOSE AND FUNCTION. White color and physical properties in goods.
METHODS OF USE. Add directly to the rubber.
VULCANIZATION. Fast curing. Less active than Horse Head XX Red 72. Similar to Green Seal-8.

Florence Red Seal-9

CHEMICAL COMPOSITION. High chemical purity. French process.
SELLER. The New Jersey Zinc Sales Co., Inc.
APPLICATIONS. Insulated wire and cable.
PHYSICAL STATE. White powder. Average particle size, approximately 0.35-micron.
PROPERTIES. Sp. gr., 5.65. Non-toxic. Disperses well.
PURPOSE AND FUNCTION. Low water soluble salt content.
METHODS OF USE. Add directly to the rubber.
VULCANIZATION. Fast curing. Less active than Horse Head XX Red 72.

Florence White Seal-7

CHEMICAL COMPOSITION. High chemical purity. French process.
SELLER. The New Jersey Zinc Sales Co., Inc.
APPLICATIONS. While this brand is primarily an oxide for the paint industry, it may be of interest in latex compounds and similar applications on account of its low apparent density.
PHYSICAL STATE. Fluffy white powder. Average particle size, 0.25-micron.
PROPERTIES. Low apparent density. Sp. gr., 5.65. Stable. Non-toxic. Disperses well.
PURPOSE AND FUNCTION. Specially selected for color and brightness.
METHODS OF USE. Add directly to the rubber.
VULCANIZATION. Fast curing. About the same order of activity as Horse Head XX Red 72.

Horse Head Special-3

CHEMICAL COMPOSITION. Low lead content zinc oxide.
SELLER. The New Jersey Zinc Sales Co., Inc.
APPLICATIONS. White rubber footwear, white sidewall tires, sporting goods, surgicals, novelties, etc.
PHYSICAL STATE. White powder selected for color, brightness, and low lead content. Average particle size, approximately 0.35-micron.
PROPERTIES. Sp. gr., 5.65. Non-toxic. Disperses well.
PURPOSE AND FUNCTION. For white and light colored rubber compounds. Reenforcing and activation.
METHODS OF USE. Add directly to the rubber.
VULCANIZATION. Slow curing. Similar to Horse Head XX Red 4.

Horse Head XX Red 4

CHEMICAL COMPOSITION. Lead content approximately 0.3% as monoxide, and sulphur trioxide equivalent 0.3%.
SELLER. The New Jersey Zinc Sales Co., Inc.
APPLICATIONS. Tires and general use
PHYSICAL STATE. White powder. Average particle size, 0.35-micron.
PROPERTIES. Sp. gr., 5.65. Non-toxic. Disperses well.
RELEVANT MATERIALS. Retards alkaline-type accelerators. Especially recommended for use with mercapto-type accelerators.
PURPOSE AND FUNCTION. This is the brand most generally used both for activation and reenforcing.
METHODS OF USE. Add directly to the rubber.
VULCANIZATION. Slow curing. Exhibits anti-scorch properties.

Horse Head XX Red 23

CHEMICAL COMPOSITION. Zinc oxide low in lead content.
SELLER. The New Jersey Zinc Sales Co., Inc.
APPLICATIONS. White rubber footwear, sporting goods, surgical rubber, novelties, etc.
PHYSICAL STATE. White powder. Average particle size, 0.35-micron.
PROPERTIES. Sp. gr., 5.65. Non-toxic. Disperses well.
PURPOSE AND FUNCTION. For white and light colored rubber compounds. Reenforcing and activation.
METHODS OF USE. Add directly to the rubber.
VULCANIZATION. Slow curing. Similar to Horse Head XX Red 4 brand.

Horse Head XX Red 72

CHEMICAL COMPOSITION. Low lead content zinc oxide.
SELLER. The New Jersey Zinc Sales Co., Inc.
APPLICATIONS. Molded goods, etc.
PHYSICAL STATE. White powder. Average particle size, approximately 0.19-micron.
PROPERTIES. Sp. gr., 5.65. Non-toxic. Disperses well.
PURPOSE AND FUNCTION. High tensile, abrasion, and tear resistance.
METHODS OF USE. Add directly to the rubber.
VULCANIZATION. Fast curing. Somewhat less active than Kadox Black Label 15.

Horse Head XX Red 78

CHEMICAL COMPOSITION. High chemical purity.
SELLER. The New Jersey Zinc Sales Co., Inc.
APPLICATIONS. Pneumatic tire carcass stocks, general activation use.
PHYSICAL STATE. White powder. Average particle size, approximately 0.40-micron.
PROPERTIES. Sp. gr., 5.65. Non-toxic. Disperses well.
PURPOSE AND FUNCTION. Specially designed for easy mixing in the Banbury. Gives low modulus and high flexing resistance when tested under compression.
METHODS OF USE. Add directly to the rubber.
VULCANIZATION. Fast curing. Less active than Horse Head XX Red 72.

Horse Head XX Red 80

CHEMICAL COMPOSITION. Leaded zinc oxide.
SELLER. The New Jersey Zinc Sales Co., Inc.
APPLICATIONS. Molded goods. Owing to its lead content, is unsuited for use in white compounds.
PHYSICAL STATE. White powder. Average particle size, 0.19-micron.
PROPERTIES. Sp. gr., 5.65. Non-toxic. Disperses well. Lead content from 0.5 to 1% expressed as lead monoxide.
RELEVANT MATERIALS. When used in substantial quantities, this brand retards thiuram accelerators and positively activates the mercapto type.
PURPOSE AND FUNCTION. Intermediate particle size, less active than Kadox Red Label 17 and Horse Head XX Red 110.
METHODS OF USE. Add directly to the rubber.
VULCANIZATION. Fast curing.

Horse Head XX Red 103

CHEMICAL COMPOSITION. Low lead content zinc oxide.
SELLER. The New Jersey Zinc Sales Co., Inc.
APPLICATIONS. Molded goods, etc., latex compounds.
PHYSICAL STATE. White powder. Average particle size, approximately 0.12-micron.
PROPERTIES. Sp. gr., 5.65. Non-toxic. Disperses well. Acidity 0.04% as sulphur trioxide.
PURPOSE AND FUNCTION. High tensile effect, high abrasion and tear resistant quality.
METHODS OF USE. Add directly to dry rubber and as water paste to latex.
VULCANIZATION. Fast curing. Shows somewhat less tendency to scorch than Kadox Black Label 15.
PATENTS. U. S. Nos. 1,522,096 to 098 inclusive. Users protected by automatic license.

Horse Head XX Red 110

CHEMICAL COMPOSITION. Leaded zinc oxide.
SELLER. The New Jersey Zinc Sales Co., Inc.
APPLICATIONS. Molded goods. Owing to its lead content, is unsatisfactory for use in white compounds.
PHYSICAL STATE. White powder. Average particle size, 0.12-micron.
PROPERTIES. Sp. gr., 5.65. Non-toxic. Disperses well. Lead content 0.5 to 1% expressed as lead monoxide. Acidity 0.04% expressed as sulphur trioxide equivalent.
RELEVANT MATERIALS. When used in substantial quantities, this brand retards thiuram accelerators and positively activates the mercapto type.
PURPOSE AND FUNCTION. Gives high tensile, high abrasion, high tear resistance, and low water absorption.
METHODS OF USE. Add directly to the rubber.
VULCANIZATION. Fast curing. Comparable with Kadox Red Label 17. Shows somewhat less tendency to scorch than Kadox Red Label 17.
PATENTS. U. S. Nos. 1,522,096 to 098 inclusive. Users are protected by automatic license.

Kadox Black Label 15

CHEMICAL COMPOSITION. Low lead content zinc oxide.
SELLER. The New Jersey Zinc Sales Co., Inc.
APPLICATIONS Molded goods, packing, latex compounding.
PHYSICAL STATE. White powder. Average particle size, approximately 0.12-micron.
PROPERTIES. Sp. gr., 5.65. Non-toxic. Disperses well. Lead content, maximum, 0.10% lead monoxide. Acidity 0.01% as sulphur trioxide equivalent. Low water absorption.
PURPOSE AND FUNCTION. For white compounds. High tensile, high abrasion and tear resistance.
METHODS OF USE. Add directly to dry rubber and as water paste to latex.
VULCANIZATION. Fast curing.
PATENTS. U. S. Nos. 1,522,096 to 098 inclusive. Users protected by automatic license.

Kadox Blue Label 16

CHEMICAL COMPOSITION. Zinc oxide with 0.15 to 0.25% lead oxide.
SELLER. The New Jersey Zinc Sales Co., Inc.
APPLICATIONS. Molded goods, packing, latex compounding.
PHYSICAL STATE. White powder. Average particle size, about 0.12-micron.
PROPERTIES. Sp. gr., 5.65. Non-toxic. Disperses well. Lead content 0.15 to 0.25% as lead monoxide. Acidity 0.01% as sulphur trioxide.
RELEVANT MATERIALS. Unsatisfactory for use in high percentages in white compounds owing to lead content.
PURPOSE AND FUNCTION. High tensile, high abrasion and tear resistance.
METHODS OF USE. Add directly to dry rubber and as water paste to latex.
VULCANIZATION. Fast curing.
PATENTS. U. S. Nos. 1,522,096 to 098 inclusive. Users protected by automatic license.

Kadox Red Label 17

CHEMICAL COMPOSITION. Zinc oxide with 0.5 to 1.0% lead monoxide.
SELLER. The New Jersey Zinc Sales Co., Inc.
APPLICATIONS. Molded goods, packing, and latex compounding.
PHYSICAL STATE. White powder. Average particle size, about 0.12-micron.
PROPERTIES. Sp. gr., 5.65. Non-toxic. Disperses well. Lead content 0.50 to 1.00% as lead monoxide. Acidity 0.01% as sulphur trioxide equivalent. Low water absorption.
RELEVANT MATERIALS. Unsatisfactory for use in white stocks because of lead content.
PURPOSE AND FUNCTION. High tensile, abrasion and tear resistance effects.
METHODS OF USE. Add directly to rubber and as water paste in latex.
VULCANIZATION. Fast curing. This brand retards thiuram accelerators when used in substantial quantities and positively activates mercapto-type accelerators.
PATENTS. U. S. Nos. 1,522,096 to 098 inclusive. Users protected by automatic license.

St. Joe Black Label 20

CHEMICAL COMPOSITION. Zinc oxide made direct from zinc ore by a continuous process of reduction and finally oxidation, using patented electrothermic process.
SELLER. St. Joseph Lead Co.
APPLICATIONS. Activating and reenforcing effects in all types of rubber compounds, also for making high-grade white compounds.
PHYSICAL STATE. White powder.
PROPERTIES. Sp. gr., 5.65. Soluble in acids and strong alkalies. Very stable. Non-toxic. Fine particle size and high state of purity. Disperses well. Laboratory control tests are applied for chemical analysis; screen test for fineness; reenforcing and activating value in vulcanized rubber.

RELEVANT MATERIALS. Reacts with fatty acids in activation of most accelerators.
PURPOSE AND FUNCTION. Activator for all accelerators, pigment for white stocks, and reenforcing effect on physical properties of stocks in general.
METHODS OF USE. Can be added in bulk in any dry mixing procedure or as a water paste in latex compounding.

St. Joe Green Label 42

CHEMICAL COMPOSITION. Zinc oxide made direct from zinc ore by a continuous process of reduction and finally oxidation, using patented electrothermic process.
SELLER. St. Joseph Lead Co.
APPLICATIONS. Activating and reenforcing effects in all types of rubber compounds, also for making very high-grade white stocks.
PHYSICAL STATE. White powder. Optimum particle size for maximum hiding power.
PROPERTIES. See data under St. Joe Black Label 20.

St. Joe Red Label 30

CHEMICAL COMPOSITION. Zinc oxide made direct from zinc ore by a continuous process of reduction and finally oxidation, using patented electrothermic process.
SELLER. St. Joseph Lead Co.
APPLICATIONS. Activating and reenforcing in all types of rubber compounds, also for making high-grade white stocks.
PHYSICAL STATE. White powder.
PROPERTIES. See data under St. Joe Black Label 20.

St. Joe U.S.P.-X

CHEMICAL COMPOSITION. Pure zinc oxide.
SELLER. St. Joseph Lead Co.
APPLICATIONS. Surgical plasters and extra-special white rubber.
PHYSICAL STATE. White powder.
PROPERTIES. Meets all requirements of U.S.P. standard.
PURPOSE AND FUNCTION. Pigment for high-quality stocks.
RELEVANT MATERIALS. Reacts with fatty acids.
METHODS OF USE. Add directly to the rubber.
VULCANIZATION. Fast curing.

Addenda—Antioxidants

Age-Rite Syrup

COMPOSITION. Ketone-amine reaction product.
SELLER. R. T. Vanderbilt Co.
APPLICATIONS. Tires, tubes, mechanicals, footwear, molded goods, sundries, etc., except white or colored stocks.
PHYSICAL STATE. Pale brown clear syrupy liquid.
PROPERTIES. Sp. gr., 1.03 (one gallon weighs 8.6 pounds). Viscosity of the order of retort pine tar. Uniform and stable. When kept in open containers, does not volatilize or thicken on long standing. Stains somewhat and discolors when exposed to light. Has no blooming effect. Disperses readily and completely in rubber.
PURPOSE AND FUNCTION. General purpose antioxidant. Imparts good resistance to flex cracking and aging.
METHODS OF USE. Up to 3% on the rubber may be used without danger of blooming. If used with other Age-Rite antioxidants, it tends to prevent blooming.
VULCANIZATION. It activates cure less than Age-Rite Resin, but slightly more than Age-Rite Powder, Age-Rite Gel, or Age-Rite H.P. Usually no adjustment of accelerator will be required.
PATENTS. Pending.

Correction

Vulcone

CHEMICAL COMPOSITION. Formaldehyde derivative of condensation product of aniline and acetaldehyde.
SELLER. E. I. du Pont de Nemours & Co., Inc.
APPLICATIONS. Tires, tubes, heels, belting, mechanicals where excellent aging and heat resistance are factors.
PHYSICAL STATE. Brown resinous powdery solid.
PROPERTIES. Sp. gr., 1.17. Melts below 75° C. (167° F.). Flash point, 171° C. (340° F.). Low toxicity. Disperses readily.
RELEVANT MATERIALS. Activated by zinc oxide 5%.
PURPOSE AND FUNCTION. Moderately fast acceleration. High heat resistance. Excellent aging.
METHODS OF USE. Add directly to rubber. Mix and handle batch as usual.
VULCANIZATION. Minimum 35 pounds' steam pressure, 139° C. (282° F.).
PATENTS. Not disclosed.

(To be continued)

Para-Graphs

RUBBER CARPET PADS. A carpet underlay possessing a combination of valuable properties has been developed. About ¼-inch thickness of hogs' hair is loosely deposited on a slowly moving belt where it is spray coated on one side, then the other, with curing latex. This lightweight padding has extreme springiness and will not pack. Being porous, it takes grit and sand from the overlaying carpet, thus preventing undue wear. It will not slip on highly polished floors and permits washing with soap and water.

RUBBER MANUFACTURING PLAY SET. This set is a combination of materials and equipment for the construction and vulcanization of small rubber articles such as balls, dolls, rings, etc. Uncured sheet rubber, with and without gas forming agents, and printed instructions will be supplied with miniature molds and thumb-screw clamping devices that will enable children to make rubber articles with the aid of the kitchen range oven.

OIL-RESISTANT RUBBER. Aromatic solvents cause swelling of chlorinated rubber, oil-resistant synthetic rubber (p-chloroprene K), and vulcanized rubber to a greater extent than aliphatic solvents, the difference being most pronounced with chlorinated rubber.

PILE FABRIC WITH PATTERNS. The unsatisfactory practice of printing designs on finished pile fabric can now be avoided by a special tufting loom equipped with dyeing pads operated with jacquard mechanism which colors, fix-washes, and dries any part of any thread necessary to the desired pattern as it passes from the creel through the tufting, latex backing, and drying operations to the roll of finished fabric.

"STICK-ON" SHOE SOLES. In leather shoe manufacture the attachment of soles is now being done by a cementing method utilizing rubber latex. This new process differs from earlier ones in that thick soles can now be attached to the uppers; whereas previously it was only found possible to apply light soles to women's shoes. During the past five years the proportion of women's shoes with cemented soles has increased from about ½% to about 36% of the total United States production.

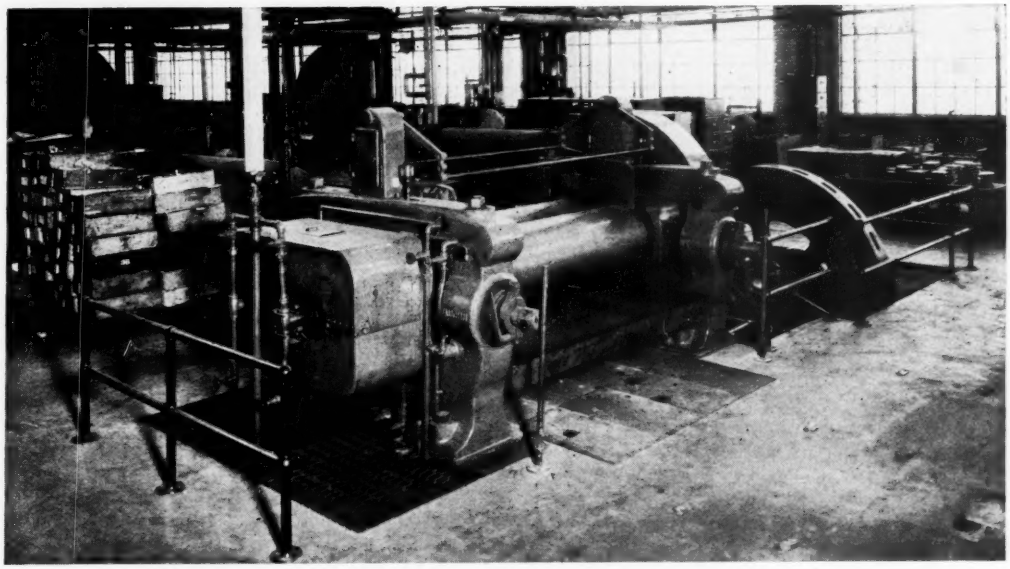
AUDIBLE SELF-FILLING PEN. This pen comprises a molded rubber bulb that snugly fits into the upper half of the barrel cavity. The bulb is closed except the lower end, which is stretched over the collar of an anchor ring fixed to the inner barrel wall. The upper closed end is attached to a clutch that operates with a thumb button forming the top of the barrel. Turning this button twists and deflates the rubber bulb; the clutch disengages, allowing the bulb to untwist and return to its normal shape. The vacuum thus created draws ink through the anchor ring into the lower portion of the barrel. Repeating this procedure finally fills both barrel and bulb with ink. The sound caused by the bulb rubbing against the barrel as it untwists announces when the pen is filled.

ALUMINUM POWDER WATERPROOFED FABRICS. This innovation in fabric waterproofing recently patented abroad stresses the claim that when incorporated in a plastic material such as rubber, aluminum powder has the property of giving a product of increased elasticity. Also it is considered an excellent insulator against heat. The new process is intended to form a really waterproof coating which penetrates the fabrics deeply.

The fabrics to be made waterproof are impregnated with aluminum dust in a solution of paraffin wax containing a plasticizing agent. Normally the solvent used for the paraffin wax is heavy benzine, the boiling point of which is about 160° C., and preferably the proportion of the aluminum dust with respect to the solution is between 5 and 20%.

Hard Rubber (Ebonite)[1]

A. R. Kemp and F. S. Malm [2]



Rubber Mill for Mixing Hard Rubber Compound

ALTHOUGH Charles Goodyear discovered the process of vulcanization of soft rubber with sulphur in 1839, it appears that Thomas Hancock was the first, in 1843, to note the formation of a hard black hornlike substance as a result of heating strips of rubber in molten sulphur for a prolonged period. The present commercial process of mixing large quantities of sulphur with rubber and heating the dough to effect vulcanization into hard rubber was actively studied by Goodyear[3] who patented a process for making this substance in 1851. The commercial manufacture of hard rubber started a few years later and increased rapidly to become an important branch of the rubber industry.

The chemical inertness, high strength, and good appearance of hard rubber have led to many of its uses. For example, the handling of acids and other corrosive liquids and gases in the chemical industry involves the use of equipment with hard rubber linings, piping, fittings, and similar parts. In the manufacture of hard rubber dentures, syringes, storage battery cases, automobile steering wheels, fountain pens, combs, and the like, these same properties are brought into play. Recognition of the excellent dielectric properties and moisture resistance of hard rubber led to its early and continued use for the insulation of telegraph, telephone, radio, and other types of electrical equipment.

Rubber chemically saturated with sulphur as a result of heating a mixture of these two substances is frequently called "ebonite" from its resemblance to ebony wood. It is occasionally called "vulcanite" because it is a product of vulcanization (heating with sulphur). The term "hard rubber" is most widely used and may mean any hard rubber composition having a vulcanization coefficient between about 25 and 47. The vulcanization coefficient is expressed as the number of units of weight of sulphur combined with 100 parts of rubber hydrocarbon. There is no terminology for describing the intermediate vulcanization products of rubber and sulphur occurring between the vulcanization coefficients of the upper limit of soft rubber and the lower limit of hard rubber which are about 4 and 25, respectively. Few rubber products are manufactured with vulcanization coefficients between these limits. Certain so-called semi-hard rubber compositions may be vulcanized to coefficients somewhat lower than 25. These materials, however, generally lack chemical stability and physical strength and are not to be considered hard rubber.

Hard rubber, like soft rubber, is compounded with other materials and may therefore contain varying amounts of modifying ingredients other than rubber and sulphur, introduced for the purpose of obtaining desirable characteristics. One, therefore, cannot set down fixed properties for this material.

Though the terms "ebonite" and "hard rubber" are synonymous, ebonite is considered by some to mean a simple basic rubber-sulphur composition which has been completely vulcanized. Even in the case of ebonite the definition is not a complete one, for various types of rubber may be used, the amount of sulphur added may range from 30 to 50%, and the temperature and time of vulcanization may vary widely.

Vulcanization

When a mixture of rubber and sulphur is heated, the

[1] Reprinted from *Ind. Eng. Chem.*, Feb., 1935, pp. 141-46. Paper presented before the Division of Rubber Chemistry at the eighty-seventh meeting of the A. C. S., St. Petersburg, Fla., Mar. 25 to 30, 1934.

[2] Bell Telephone Laboratories, New York, N. Y.

[3] Nelson Goodyear, U. S. patent No. 8,075 (1851).

sulphur present combines with the rubber in such a manner as to render it unextractable with acetone. Ostwald[4] and later Harries[5] considered this change known as vulcanization to be due to adsorption of the sulphur by the rubber. This theory is untenable in view of the overwhelming evidence shown by numerous investigators[6-11] that, under suitable conditions of heating, sulphur adds chemically to the double bonds in the rubber hydrocarbon to the point of saturation and then stops. This point corresponds to one sulphur atom added to the double bond in each C_5H_8 group, yielding a product $(C_5H_8S)_n$ containing 32.00% sulphur in chemical combination. Spence and Young[9] found that gutta percha and balata hydrocarbons react with sulphur in a similar manner to rubber. Whitby and Jane[11] heated rubber for long periods with a large excess of sulphur in various solvents at various temperatures and found that the acetone-insoluble product always contains close to 32.00% of combined sulphur. They also found that acetone-extracted ebonite dust (polyprene sulphide) is incapable of bringing about vulcanization when mixed with crude rubber and heated, illustrating the firm bond which exists between the sulphur atoms and the rubber molecule.

The treatment of acetone-extracted soft vulcanized rubber with bromine[8] or iodine chloride[12] results in the addition of halogen equivalent to the unsaturated part of the rubber-sulphur complex as calculated from its combined sulphur content which is further evidence of the chemical nature of the reaction of sulphur with rubber.

Since sulphur reacts with rubber only very slowly at room temperatures, vulcanization of hard rubber is usually carried out at temperatures between 130° and 160° C. The temperature coefficient of the reaction velocity above 100° C. is about 2.7 for each 10° rise in temperature[9]. Davies[13] found the temperature coefficient of hard rubber formation to be 2.52 at 140° to 150° C., 2.80 at 150° to 160°, and 3.13 at 160° to 170° for a compound consisting of smoked sheet 100, sulphur 50, zinc oxide 5, and stearic acid 0.5-part. When various organic accelerators were added to this compound, the temperature coefficient was found to vary from 1.53 to 3.04. The commercial period of vulcanization of hard rubber generally ranges from about 15 minutes to 20 hours, depending upon the composition, the temperature employed, and the dimensions of the article.

The hard rubber reaction liberates considerable heat. Perks[14], for example, showed that 3.5-cm. cylindrical specimens of rubber-sulphur mixtures, when heated in a bath to 160° C., reach an internal temperature more than 100° above that of the bath, as a result of the heat liberated from the reaction. This heat is liberated suddenly at a certain stage in the reaction and is accompanied by a vigorous evolution of hydrogen sulphide. Riding[15] vulcanized a 3.5-cm. cylinder of a 65-35 rubber-sulphur mixture at 145° C. and obtained an internal temperature rise of about 60°. However, when vulcanizing at 135° C., the internal temperature rise was only about 10°.

When the vulcanizing temperature reaches 175°, the sulphur commences to react by a process of substitution or dehydrogenation. This reaction becomes fairly rapid as the temperature exceeds 200°, and copious amounts of hydrogen sulphide are given off. Therefore, in curing thick articles of ebonite, low temperatures and long periods of vulcanization must be used or the material becomes porous or converted to a spongy brittle mass as a result of excessive internal temperature. Organic accelerators must therefore be used with caution in hard rubber, especially in the curing of thick articles of ebonite. Their use sometimes is attended with difficulties such as scorching, porosity, surface discoloration, and brittleness in the final product. Certain accelerators, however, are widely used, especially in press-vulcanized hard rubber articles which are so compounded as to lessen the difficulties attendant upon rapid curing. Recently Davies[13] has studied the relative efficiency of various organic accelerators in promoting the vulcanization of ebonite.

Glancy, Wright, and Oon[16] found that the use of various accelerators increases the rate of vulcanization of hard rubber at 170° C. to a lesser degree than with soft rubber.

Stevens and Stevens[17] vulcanized hard rubber at 70° and 100° C. for long periods of time, employing a large excess of sulphur in the presence of ultra-accelerators. These authors have interpreted their results as showing that extensive substitution occurs under these conditions as judged by "coefficients" in one case as high as 142.8. The composition with the high coefficient of 142.8 cited by the two Stevens contained 100 parts of rubber, 20 parts of sulphur, 20 parts of zinc oxide, and 20 parts of zinc diethyldithiocarbamate. The highest possible vulcanization coefficient in this case would therefore be 20. The combination of sulphur with the zinc salts must also be considered as introducing errors into the determination of sulphur combined with rubber. None of these results, therefore, can be taken as evidence that substitution occurred. In view of the low temperatures and long periods used by the Stevens for vulcanization, one would scarcely expect substitution of sulphur to take place.

Recently the use of selenium[18] has been proposed for accelerating the cure and improving the physical properties of hard rubber. Blake[19] has found that ebonite cannot be formed by the use of selenium alone.

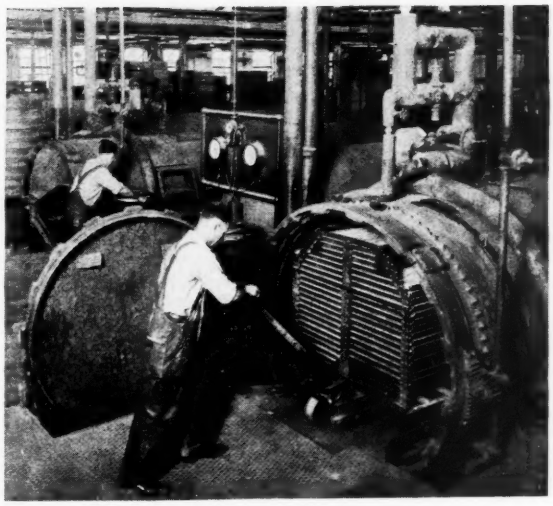
The effect of the resin and nitrogeneous constituents on the vulcanization of hard rubber has not been as carefully studied as in the case of soft rubber. Spence and Young[9] showed that these non-hydrocarbon constituents were not essential in the vulcanization of hard rubber. Whitby's results[11] indicate that rubber from which the resin and some of the protein had been extracted vulcanized to hard rubber at a somewhat slower rate than unextracted rubber. It can be said in a general way that the normal variations in the resin and protein content of crude rubbers of the better quality do not need to be taken into account in the manufacture of hard rubber. Washed and dried caucho, which ordinarily contains upwards of 5% resin and less than 0.1% nitrogen, produces hard rubber of excellent quality. It is well known that caucho rubber produces a very inferior soft rubber as compared with Para, indicating that the elastic structure or "nerve" of the crude rubber is not so important in hard as in soft rubber manufacture.

In view of the fact that soft, sticky, wild rubbers produce satisfactory hard rubber[20], it might be surmised that normal variations in milling of plantation rubber would not injure the quality of the resulting hard rubber product. Spence and Ward[21] found that long milling did not

[4] Ostwald, *Kolloid-Z.*, 6, 136 (1910).
[5] Harries, *Ber.*, 49, 1196 (1916).
[6] Bacon, *J. Phys. Chem.*, 32, 801 (1928).
[7] Hinrichsen and Kindscher, *Ber.*, 46, 1291 (1913); *Kolloid-Z.*, 10, 146 (1912).
[8] Spence and Scott, *Kolloid-Z.*, 8, 308 (1911).
[9] Spence and Young, *Ibid.*, 11, 28 (1912); 13, 265 (1913).
[10] Weber, "Chemistry of India Rubber," p. 91 (1902).
[11] Whitby and Jane, *Trans. Roy. Soc. Can.*, III, 20, 121 (1926).
[12] Kemp, Bishop, and Lackner, *Ind. Eng. Chem.*, 20, 427 (1928).
[13] Davies, *Trans. Inst. Rubber Ind.*, 10, 176 (1934).
[14] Perks, *J. Soc. Chem. Ind.*, 45, 142T (1926).
[15] Riding, *Trans. Inst. Rubber Ind.*, 6, 230 (1930).
[16] Glancy, Wright, and Oon, *Ind. Eng. Chem.*, 18, 73 (1926).
[17] Stevens and Stevens, *J. Soc. Chem. Ind.*, 48, 55T (1929).
[18] *Vanderbilt News*, 3, 4 (1933).
[19] Blake, *Ind. Eng. Chem.*, 26, 1283 (1934).
[20] Hutin, *Caoutchouc & gutta-percha*, 21, 12, 290 (1924).
[21] Spence and Ward, *Kolloid-Z.*, 11, 274 (1912).

affect the rate of vulcanization of hard rubber. Davies[22] found that excessive milling reduced the ultimate tensile strength of hard rubber by about 20%. Davies[13] also found that the effect of prolonged mastication after the addition of sulphur was more severe than overmastication of the crude rubber alone. It is of general experience, however, that normal variation in milling time does not affect the quality of hard rubber.

Blake[23] has summarized the literature on the heat of vulcanization of rubber. His own investigation of this subject was made by determining the heat of combustion of vulcanizates containing up to 32% sulphur. The differences between the values found and those calculated were taken as the heat of reaction of sulphur with rubber. His results showed that 300 calories per gram of compound were liberated in the formation of polyprene sulphide $(C_5H_8S)_n$. He found that the heat of vulcanization increased in a linear fashion as the combined sulphur increased from 6% to the highest value.



Vulcanizing Equipment for Rods and Tubes

Hada, Fukaya, and Nakajima[24] carried out a similar investigation, but considered the heat liberated as a result of the sulphur trioxide formation in the combustion rather than sulphur dioxide assumed by Blake. They found the heat of reaction increasing to over 600 calories per gram of compound at 10% combined sulphur content, decreasing to –40 calories at a sulphur content of 28%. The wide differences of these results from those of Blake would lead to the conclusion that there is need for further study of this important subject. Recently Jessup and Cummings[25] found a strictly linear relationship to hold between the heat of vulcanization and the combined sulphur content over the whole range. They obtained a value of 145 calories per gram of compound as the heat liberated in the formation of polyprene sulphide.

Chemical Properties

Hard rubber gradually softens upon heating and at 100° C. it becomes quite flexible. Above this temperature various investigators[26-29] have shown that hydrogen sulphide splits off from hard rubber in increasing amounts with rise in temperatures up to 265° C. Cummings[26], for example, found that a vulcanized composition of 80 parts rubber with 20 parts sulphur made from purified rubber lost about 1.7% sulphur as hydrogen sulphide when heated for 8 hours from 105° to 265° C.; while a 68-32 composition lost 10.4% sulphur under the same conditions. The results of Cummings show that each added increment of sulphur combined with rubber from the composition $(C_{10}H_{16}S)_n$ to $(C_5H_8S)_n$ shows an increasing degree of instability. The work of Hinrichsen and Kindscher[7] and Whitby and Jane[11] in removing sulphur from hard rubber by treatment with alcoholic potash and of Spence[30] by the use of metallic sodium leads to the same conclusion.

Between 260° and 280° C. hard rubber melts to a jet black resin which on cooling is a hard brittle substance. This material becomes very plastic at about 80° C., possesses good adhesive properties, and is useful for filling defects in hard rubber parts. Bolas[31] mentions the use of this material as a binder in grinding wheels. Kemp[32] found that vulcanizates with sulphur contents varying from 8 to 16% become thermoplastic as a result of heating to high temperatures.

Midgley, Henne, and Shepard[33] subjected ebonite to destructive distillation and identified various thiophenes and aromatic hydrocarbons in the products. The same authors[34] on the basis of this study proposed a structural formula for ebonite where sulphur is linked to a carbon atom bearing a methyl group on the one side and to the next third carbon atom of the rubber chain on the other side.

Hard rubber compositions with vulcanization coefficients above 30 are very stable under ordinary conditions and show few signs of physical deterioration after many years. Dieterich and Gray[35] showed that hard rubber was unaffected by heating 14 days in air at 70° C. When the heating was conducted for 60 hours at 150°, they found that considerable decrease in impact and transverse strengths had resulted. In general it may be concluded that hard rubber retains its excellent physical characteristics unimpaired for many years under ordinary conditions of use.

On exposure of hard rubber to sunlight or to a light rich in ultraviolet rays, a film of sulphuric acid is formed on its surface. According to Fry and Porritt[27] this acid is the result of oxidation of sulphur in the polyprene sulphide complex. Evidence on this point has been obtained[36] by exposing an acetone-extracted sample of ebonite to sunlight; the removal of free sulphur did not affect the formation of acid on the surface. It is also possible that the formation of sulphuric acid may result from the photochemical oxidation of the hydrogen sulphide which is split off from the polyprene sulphide.

This susceptibility of hard rubber to light deterioration is an objectionable property in its use for electrical insulation where light exposure is involved, since it results in greatly increased electrical conduction over the surface. Curtis[37] studied this effect from the electrical standpoint and showed that on removing the acid from the surface with distilled water the high initial surface resistivity of hard rubber is restored. More research is needed to improve hard rubber from the standpoint of its resistance to the effect of sunlight.

The excellent resistance of hard rubber to many chem-

(*Continued on page* 44)

[22] Davies, *Trans. Inst. Rubber Ind.*, 9, 130 (1933).
[23] Blake, *Ind. Eng. Chem.*, 22, 737 (1930).
[24] Hada, Fukaya, and Nakajima, *J. Rubber Soc. (Japan)*, 2, 389 (1931); *Rubber Chem. Tech.*, 4, 507 (1931).
[25] Jessup and Cummings, *Bur. Standards J. Research*, 12, 357 (1934).
[26] Cummings, *Ibid.*, 9, 163 (1932).
[27] Fry and Porritt, *India Rubber J.*, 78, 307 (1929).
[28] Webster and Porritt, *Ibid.*, 79, 329 (1930).
[29] Wolesensky, *Bur. Standards, J. Research*, 4, 501 (1930).
[30] Spence, U. S. patent No. 1,235,850 (1917).
[31] Bolas, *J. Roy. Soc. Arts*, 28, 763 (1880).
[32] Kemp, U. S. patent No. 1,638,535 (1927).
[33] Midgley, Henne, and Shepard, *J. Amer. Chem. Soc.*, 54, 2953 (1932).
[34] *Ibid.*, 56, 1326 (1934).
[35] Dieterich and Gray, *Ind. Eng. Chem.*, 18, 428 (1926).
[36] Bell Telephone Lab., unpublished work.
[37] Curtis, Bur. Standards, *Bull.*, 11, 402 (1914).
[38] *Chem. & Met. Eng.*, 33, 627 (1926).
[39] Bath, *India Rubber J.*, 79, 935 (1930); 80, 67 (1930).
[40] Curtis, McPherson, and Scott, Bur. Standards, *Sci. Paper* 560 (1927).
[41] Fritz and Hoover, A. S. T. M., Symposium on Rubber Preprint, pp. 79-90 (Mar. 9, 1932).

Annals of Rubber[1]

Chronological Record of the Important Events in the History of Rubber

1847. Thomas Forster patented improvements in machinery for cutting india rubber, for rendering fabrics waterproof, and for dissolving india rubber and other gums. His solvents were alcohol and coal oil. He also used alcohol when combining india rubber with shellac.

Charles Hancock patented improvements in gutta percha, using baths for that purpose. In these baths he used carbonates of potash or soda, or muriate of lime, or other salts. He also used fixed oils or fats. He sometimes enveloped the gutta percha in cloth, plaster of Paris, clay, etc. He also boiled the gutta percha in a bath of caustic alkali mixed in certain proportions with oxides of iron and lead, glue, and bitumen. This rendered the gutta percha harder, more durable, and better adapted for bearing friction and resisting the weather.

Thomas Forster brought out another patent combining gutta percha with animal charcoal, whalebone, hydrate of sulphur, musk, tonquin beans, orris-root, or gum-benzoin. He cleaned gutta percha by cutting the blocks into small pieces, after which they were passed cold through crushing rollers, and well washed in lukewarm water.

Thomas Hancock and Reuben Phillips on the last day of the year took out a blanket patent involving many processes, one of which was making molds of materials capable of being dissolved at temperatures so low as not to be injurious to the manufactured material, such as Darcey's alloy, or compound of gum, glue, etc. There were no United States patents of note in this year.

Dr. Oxley called attention to the great destruction of gutta percha trees around Singapore. In order to obtain the gum the tree was felled, and for the comparatively small exports whole forests were leveled. The agitation that ensued was productive of good results, and tapping was substituted. The loss was so great, however, that Borneo acquired afterward a prestige that at the start belonged to the Singapore section.

Nathaniel M. Hayward was among those who were first brought into prominence in the rubber business in the United States. His first venture in this business was as manager of a company formed at the Furnace, at South Easton, Mass., for manufacturing a waterproof fabric to form a sandal to be worn outside the shoe. The attempt was a failure. He next started a small factory in East Woburn, Mass., and made sun goods, which sold very well. His next move was to Lisbon, Conn., where he became associated with Gov. William A. Buckingham and his brother, I. M. Buckingham, James S. Carew, of Norwich, and Henry Burr, of Colchester. They secured a factory and commenced the manufacture of rubber boots and shoes. After a few years the plant was removed to Colchester, was operated under the style of the Hayward Rubber Co., and for many years was the leading manufactory in its line. After Hayward's death it was finally conveyed to new management and was known as the Colchester Rubber Co.

Mr. Hayward was at one time the owner of a large plant at Providence, R. I., but when that plant was destroyed by a boiler explosion, he sold the land and secured a large interest in the Boston Rubber Shoe Co., Malden, Mass., which he afterward sold to the Hon. Elisha S. Converse. He then started a factory at Wyoming, Mass., called the Red Mills, and made a specialty of pressed work. During the Civil War he made large contracts and furnished the Government with large quantities of blanket, haversacks, and canteens. During the war this mill was run day and night. In 1864 he closed out his interest in the Hayward Rubber Co. He was the inventor of the rubber wringer roll.

In 1847 Burke studied the use of sulphide of antimony or golden sulphuret in vulcanization. First he observed its photogenic action, remarking that it afforded protection against the destructive effect of sunlight and had a peculiarly soft vulcanized product. It was on these chemical researches that the creation of automobile inner tubes was based.

Among the numerous chemists of that time who sought means for perfecting vulcanization should be mentioned Moulton, who proposed the use of lead sulphide; Tonner, who employed a mixture of the sulphides of bismuth and lead to give to caoutchouc greater resistance to high temperatures; Schwaintz, who perfected Goodyear's process by substituting the glycerine vapor bath and recommended to employ chalk and zinc oxide in the mixings; and Balard, who with the discovery of bromine proposed to substitute sulphur bromide for chloride in vulcanization.

S. Moulton obtained English patent 11,567 (1847) for vulcanization of rubber by lead sulphide.

1848. Gutta percha hose and tubing began to be used. Gutta percha also was used for shoes, and to some extent employed as a substitute for patent leather, but as it was found for the latter purpose not to be durable, it gradually was abandoned.

About this time the use of gutta percha as an insulator began to take form, and the establishment of manufactories both in America and Europe began to be noted. In America the building of a factory by the American Gutta Percha Co. in Brooklyn, N. Y., took place, and this company was known as the Bishop Gutta Percha Co.

William Henry Barlow and Thomas Forster took out patents for the coating of telegraphic wires with gutta percha. It was combined with cowrie or New Zealand gum and flowers or milk of sulphur. Eight parts of gutta percha were kneaded at a temperature of 120° F. with one part of cowrie and one part of flowers or milk of sulphur, the divisions being by weight.

Charles Hancock employed glass molds for shoes and galoshes made of gutta percha. In complete insulation he boiled gutta percha with muriate of lime, afterward sifting resin on while the compound was being passed between heated cylinders. Later in the year he brought out a variety of molds and apparatus for various purposes, all intricate in their designs and modes of operation. In molding gutta percha on to continuous lengths of wire, etc., he used the combination of a die box and a cylinder with piston, each working in directions at right angles, or more or less tangential to the other.

(*Continued on page* 38)

[1] Continued from India Rubber World, Apr. 1, 1935, p. 40.

Surface Tension of Latex[1]

Royce J. Noble, Ph.D.

IN ANY liquid system the molecules within the main body of the liquid are assumed to be equally attracted in all directions. At the surface of the liquid, that is, at the liquid air interface, the molecules are subject to somewhat different conditions. They cannot be attracted equally on all sides, and attractive forces which would normally be exerted upward must be distributed downward toward the next layer of molecules or toward adjacent molecules. These excess attractive forces produce in this way certain peculiar properties in the surface layer. The free energy thus available at the surface is responsible for the surface adsorption of nearly any added material; these added substances serve to saturate the free energy bonds. If the free energy is not satisfied in this way, it produces a skin effect on the surface of the liquid; the contractile force resulting causes the liquid to assume such shape that it will have a minimum area, that is, the formation of spherical drops.

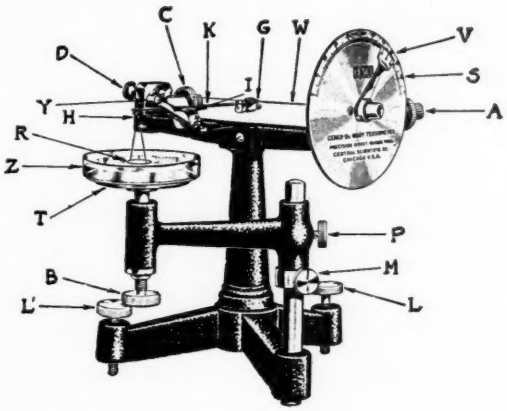


Fig. 1. Cenco-du Nouy Precision Tensiometer

If to a pure liquid are added certain soluble materials, such as soap, this material is rapidly concentrated on the surface of the liquid as a result of the surface energy. The contractile forces existing at the surface are thus reduced. As a result, the liquid has greatly enhanced wetting properties.

This force existing at the surface of the liquids is measured as surface tension, which may be defined as the surface force of the liquid at the liquid vapor interface. It is proportional to the difference between the density of the liquid and the density of its vapor. It must, therefore, also vary with the temperature. This force is usually measured in units of the centimeter-gram-second system, the unit of force being the dyne and the unit of length being the centimeter. The value is expressed as the force in dynes per unit of length. Thus if we were to draw a line one centimeter long at the surface of the liquid, the forces existing at right angles to this line would represent the surface tension.

Several elaborate methods have been devised for the measurement of surface tension. The ring method most commonly employed today combines simplicity of operation with accuracy of results. Measurements may be made rapidly with a small quantity of liquid. Apparatus has been so constructed that readings may be taken directly without calculations. The type of instrument employed is shown in Figure 1. The apparatus consists essentially of a wire *W* maintained under tortion as adjusted by the screw *D* so that with the indicating vernier arm at the zero position the balancing arm *K* holding the ring *R* is just maintained in a free position as shown in *I*. The liquid whose surface tension is to be determined is placed in a dish and slowly raised into position until the ring just touches the surface of the liquid. By means of the knob *A* the vernier arm is slowly turned, producing a tortion in the wire and so raising the ring. The point at which the ring just breaks free of the liquid is thus indicated on the scale *S* and may be read off directly as surface tension in dynes per centimeter. While the reading is being taken, the glass dish is so lowered as to maintain the balancing arm in its neutral position, thus counterbalancing the lifting force on the arm resulting from tortion in the wire. It is essential that the dish used to contain the liquid be thoroughly clean since the presence of small amounts of foreign material may greatly affect surface tension.

Latex is an exceedingly complex colloid system and the aqueous portion contains a large number of different materials, all of which result in a surface tension much different from that of water. Whereas pure water has a surface tension of 73 dynes per centimeter, fresh latex has a surface tension of approximately 40 dynes per centimeter, and this is further reduced by the ammonia used as a preservative to a value which in some cases may be as low as 36 dynes per centimeter. In most operations involving the use of latex, this surface tension value is of considerable importance. It is particularly important in the use of latex for impregnation purposes and it also greatly affects compounding practice. In the impregnation of fabrics difficulty is experienced in attaining complete penetration of the yarns with any aqueous medium. Pure water does not readily wet most fibers. This is especially true if the fibers have not been thoroughly cleaned of natural oils and waxes. Latex, having a surface tension considerably lower than that of water, more readily wets such fibers, but the wetting is greatly improved by the addition of materials to the latex which are adsorbed at its surface and so decrease the surface tension.

Numerous materials are available as surface tension depressors or wetting agents. Perhaps the most common of such materials is soap. Within recent years a number of sulphonated aromatic compounds have been offered for this purpose, some of which are exceedingly effective in very small amounts. Examples of this latter class of materials are the several grades of Nekal, the Alphasols, Aresklene, Stablex A, Aquarex D and F, and the Igepons. The effectiveness of these materials is indicated by the fact that the surface tension of water, normally 73, is reduced to 30 or slightly below by as

[1] Heveatex Corp., Melrose, Mass.

little as 0.2% of certain of these materials. They are equally effective in latex and make possible impregnations with latex which approach those obtained by benzol solutions of rubber.

There are at least two methods of employing such wetting agents in latex for purposes of impregnation. In one method the fabric or other material is saturated with a very weak solution of the wetting agent, squeezed out, and dried. A small amount of wetting agent is in this manner uniformly distributed throughout the fabric. Upon wetting the fabric again with a dilute latex solution, good penetration is obtained throughout. The second method, and the one most commonly employed, consists in adding the wetting agent, previously dissolved in water if necessary, to the latex. This method is to be preferred, not only because it is the simpler method of operation, but because equally good wetting and penetration is obtained, and, in addition, some stabilizing effect is obtained from the wetting agent.

Wetting agents may be evaluated for impregnation purposes in two principal ways: a direct determination of the surface tension of a weak solution of the wetting agent may be made in the method outlined above, or the rapidity with which a fabric is wetted in a solution of the wetting agent may be determined. The rate of wetting a fabric is determined by taking a sample of fabric, yarn, or the like, of known weight and immersing it in a solution of wetting agent of about 0.01% concentration. The fabric is held just beneath the surface of the liquid by a sinker of suitable weight. The fabric will sink to the bottom only after being thoroughly wetted, and the time required for this wetting is noted.

In compounding operations surface tension also plays an important part. Many materials used in compounding latex are not readily wetted by water. As an example, sulphur is particularly difficult to disperse properly in either water or latex, and as the particle size decreases, it becomes increasingly difficult to wet. As the particle size of such materials is decreased, the surface area is rapidly increased so that the surface of liquid in contact with such particles must be greatly increased if perfect wetting is to take place. This increase in surface of the liquid is only brought about in the expenditure of energy as against surface tension forces which tend to keep the surface of the liquid at a minimum. For this reason wetting agents which lower the surface tension are a very necessary adjunct to the preparation of dispersions of such compounding materials. It is to be noted, furthermore, that although such difficultly wettable materials may be satisfactorily dealt with with the assistance of a wetting agent, it is nevertheless difficult to maintain dispersions of such substances. The particles on coming in contact have a strong tendency to coalesce with consequent reduction in the amount of surface area, thus counteracting the effect of dispersion. In order to make these dispersions permanent, therefore, it is necessary to provide some stabilizing agent which in effect acts as a buffer between the dispersed particles and so prevents them from coalescing or completely coagulating and separating from the aqueous medium. For this reason in the preparation of dispersions of compounding agents it is generally desirable to use two types of assistants, a wetting agent and a dispersing or stabilizing agent. In some instances one material may be employed for both purposes although most stabilizing agents are characterized by a relatively high surface tension. If, however, its solution in water effects a moderate depression of the surface tension, performing both functions may suffice.

Annals of Rubber

(*Continued from page* 36)

In 1848 the Hayward Rubber Co., the L. Candee Co., Ford & Co., of New Brunswick, N. J., and the Newark Mfg. Co. purchased the exclusive right to manufacture rubber boots and shoes under the Goodyear patent. Two other concerns, the Goodyear Metallic Rubber Shoe Co. and Onderdonk & Letson, New Brunswick, N. J., declined to purchase, but paid royalties.

1849. Henry G. Tyer experimented with zinc oxide and patented a beautiful and durable white rubber January 30, 1849, which was reissued in August of the same year. Also H. G. Tyer and John Helm patented an improvement in the manufacture of india rubber, which was a combination of caoutchouc with either carbonate of zinc or sulphate of zinc.

Charles Goodyear patented an improvement of uniting felting with a cotton fiber to caoutchouc. He afterward surrendered his claim to this patent and placed it in another form, applying it to boats. His early patent for a rubber cement expired this year. Mr. Goodyear had now been busy several years exploiting his inventions and establishing licensed manufactories. The Goodyear India Rubber Glove Co. had built a small mill at Naugatuck, Conn., (1844), and this was his favorite headquarters for operations. He favored the issuance of licenses for special lines, giving one party exclusive right to manufacture shoes, another clothing, etc., a system he maintained until the final expiration of the controlling patents, 1862.

F. M. Ray placed helical springs within hollow springs made of metallic or vulcanized india rubber, claiming that this mode increased the tension and prevented spreading.

Charles Walker applied caoutchouc to the rubbing surfaces of rice hullers.

In England, John Dalton applied gutta percha to calicoes. His composition was five pounds of gutta percha in one gallon of benzole, naphtha, spirit of turpentine, camphene, bisulphuret of carbon, or other proper solvents, preferring, however, benzole or bisulphuret of carbon, as they are exceedingly volatile.

John Edward Payne patented improvements in marine vessels, in life preserving apparatus, and in the making of hollow figures.

The manufacture of cables and insulated wire for telegraphic purposes at this time received a great impetus from the special adaptation of gutta percha to this new want of civilization. The only manner of crossing streams was by stretching wires between tall masts, obviously difficult of construction and maintenance, or subjecting communication to intermittent interruption at draw-bridges, a system that would not be tolerated at present. In this year we have a record of the first cable laid in this country, at a locality on Hudson River between Fort Lee, N. J., and 125th Street, New York, N. Y.

1850. F. D. Hayward and J. C. Bickford patented an improvement for spreading rubber by pressure on rollers and at the same time grinding and fixing it against and into the substances of the cloth.

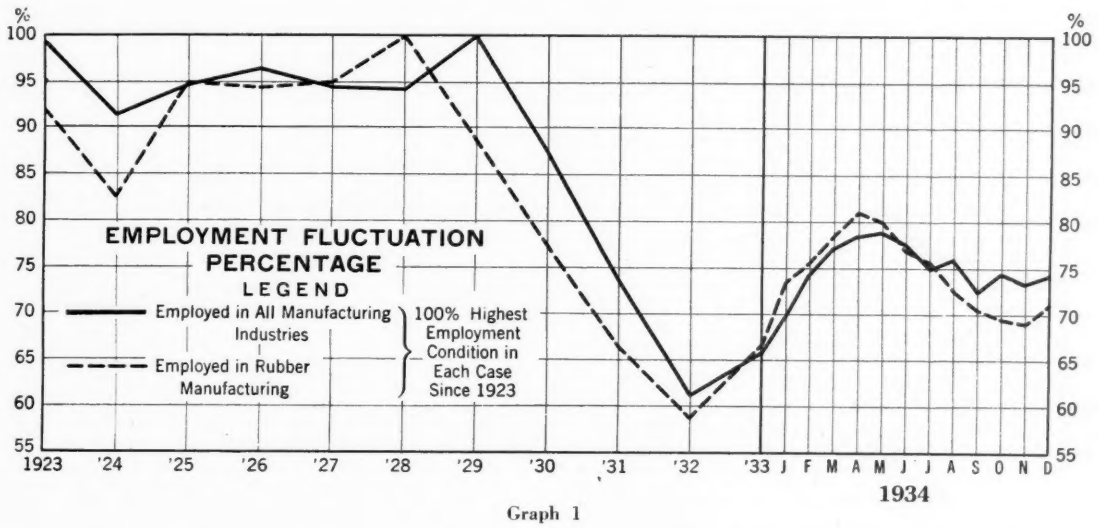
John Pridham combined oxide of tin with caoutchouc; this with sulphur produced a fabric with a black surface.

Peter Dorn made a half shoe similar to the present foot-hold.

(*To be continued*)

Collective Bargaining

D. C. McRoberts



Graph 1

WORKERS in industry should organize only for the purpose of enhancing their ultimate welfare. To achieve this end they must exercise the soundest type of individual and collective judgment.

Importance of Facts

Judgment is a fact finding and fact weighing mental process that culminates in a decision to act or not to act and what action to take. It is of a degree of soundness strictly in proportion to the accuracy and completeness of the facts accumulated and the correctness of their correlation and interpretation.

Ordinarily the first few facts that are easily found, or perhaps freely offered, obviously and logically point to but one conclusion. Time will prove, almost without exception, that a conclusion thus reached is the product of poor judgment, a stampeded mental process. The very ease with which the conclusion can be reached should arouse skepticism and at the same time a determination to obtain and to know the effect of further facts. They will either tend to confirm the soundness of that first conclusion or temper and possibly completely reverse it.

Sound judgment, therefore, consists of the invariable habit of considering a great many facts to reach a decision; poor judgment is content with a few facts, perhaps even impressions. Impressions are guesses, not facts. This process of reasoning probably was the basis for that excellent, but frequently ignored injunction, "Get the facts before the facts get you."

Employe-Employer Relations

This article is to bear on that so-called chaotic condition of employe-employer relations. Its realm is to set forth a few points, although not all, that workers should consider in reaching a sane and sound decision about how to improve, if possible, the matter of relations with their employers. Regardless of outside agencies that may be most prominently and publicly associated with this matter, or the real reasons underlying that prominence, the workers and the employers have the most intimate and rightfully vital interest; therefore they should and will, in the last analysis, be the most important factors, if not the most prominent, in the choosing and subsequent operation of any newly adopted corrective plan. Of these, workers will have the major responsibility because they are far greater in numbers and they are the complainants; in any event the much publicized, yet intangible complaints against employers are registered in the workers' name.

Finding Source of Agitation

Of what does this so-called chaotic employe-employer relation problem consist?

What are the specific complaints?

Have they been voluntarily registered by workers, or have workers been influenced to do so by some "too philanthropic-to-be-genuine" inside radical or outside coercive interests?

Who expects to benefit and how?

These questions are not designed to minimize the importance of unwarranted conditions of employer exploitation, and there are such cases, but to direct the thinking processes of the group most affected, the workers, into the heart of the problem; to differentiate between facts that belong there and influences that may not; and to secure uninfluenced, but fair consideration of those things that affect the workers' own best ultimate welfare.

Both Strive for Business Volume

That the best ultimate interest of workers and of employers is and must be very closely akin, regardless of misguiding argument to the contrary, is self-evident to any person who is not possessed of a perverted, shallow, and unreasoning communistic mind. Both have one and the same major objective that subordinates all other de-

sires and preferences. That major objective for which both must strive, and without which neither can survive, is the stability of a suitable volume of sound business.

The Employer's Part of the Job

The employer represents the financial investment that provides business institutions, which in turn furnishes all the work, not only for workers, but for politicians, bankers, labor leaders, teachers, everyone in fact but farmers and, to some extent, even for them. It is the responsibility of the employer so to manage business that the financial investment will earn a reasonable return; otherwise the investors strike by ceasing to invest—you may be one of them; business institutions close down or collapse; jobs disappear. All of us, unfortunately, have experienced or at least have seen just these things happen during the past five years. Nor can the multitude of public-spirited (?) critics absolve themselves of their share of blame by their fallacious explanations of how the avaricious, incompetent, and near-sighted employer had caused it all, finishing with an attempt to clinch the point with a series of absurd and conceited "I told you so's."

The Worker's Part of the Job

Upon the worker falls the responsibility of combining labor and materials to produce goods at a cost that will stimulate wider use and satisfactory volume demand. Employes and employers, therefore, are the two and only groups that are the direct producers of goods. They are logically and necessarily partners in a common enterprise.

Workers in most industries so greatly outnumber employers that frequent individual contact and exchange of ideas are not only impracticable, but impossible; yet there is a necessity of both to understand the ideals and problems with which the other is faced. A healthy, permanent mutuality of interest cannot exist without some adequate means of frank, fearless, systematic intercommunication.

Worker and Boss Contacts

This contact between employe and employer may be accomplished in a very small enterprise without any type of organized representation because the owner-employer contacts with his employes sufficiently that each is conversant at all times with the problems and perplexities of the other. Each, then, can temper his own desires and actions to cooperate with the other to achieve the common objective without the danger of either misunderstanding the necessity of and reasons for the sacrifices, when involved. Larger businesses can obtain the desirable mutuality of interest, confidence, and understanding only by some type of organized representation.

Collective Bargaining Agencies

Employe representation or collective bargaining for this condition can be accomplished either with one of the various types of factory councils or by means of a labor union. Many forms of each have been in use for years under various circumstances and with varying degrees of success from perfection to chaos, depending on: the conditions attending introduction; the common desire for its presence; the suitability of the form adopted to the type, size, and character of the particular business; the degree to which the organization was constituted equitably and honestly to represent both employe and employer interests, to the exclusion of inside or outside avarice or ulterior motives; and the extent to which it nurtured moderation and confidence, not agitation and hatred.

[1] "Labor, Industry and Government," Matthew Woll, pp. 13-14.

Know All Plans

Workers of a given plant or industry should investigate through authentic sources the history, fundamental principles, policies, objectives, and the methods of operation of all forms of factory councils and unions in order to know definitely which type will suit their own best interests. This matter is of vital importance to workers, but one about which they have been prone to do little or nothing for themselves, thus providing a responsive, if not even a lucrative field, for the activities of volunteer reformers who normally give only biased and inflammatory enlightenment.

Leadership in Progressiveness

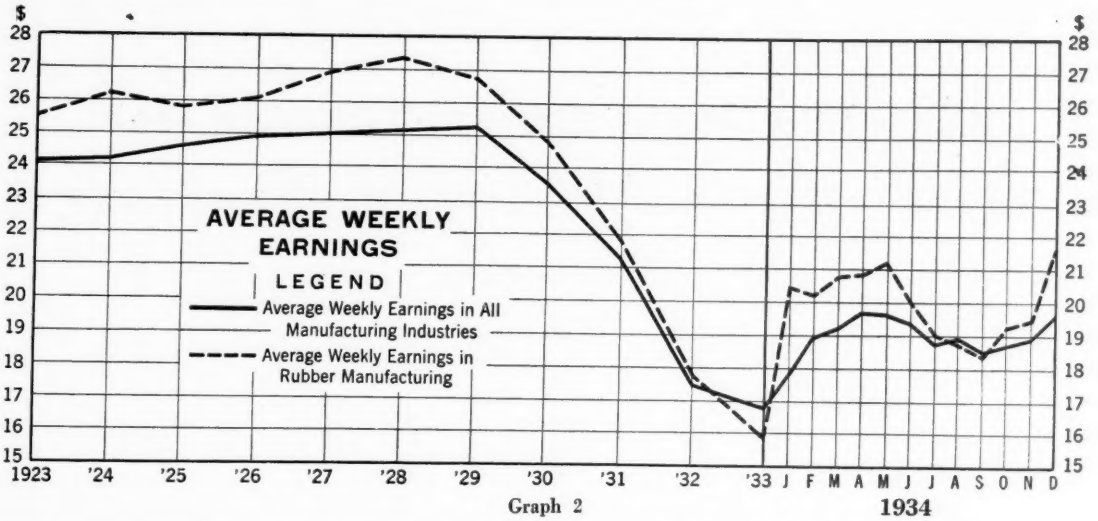
During the past 150 years the United States has grown from a position of little importance industrially to one of outstanding leadership among the industrial nations of the world. Coincident with this rise the population has grown from approximately 4,000,000 people to over 122,000,000 people. Standards of living, for American people in general, have grown from that simple rugged frugality of our forefathers to a point where most of our people regard as necessities devices which only a few years ago were luxuries for the wealthy and shortly before that non-existent. Our lowest standard of living today is reputed to be above that of 80% of the world's two billions of inhabitants. It is perhaps needless to point out that this progress could not have occurred except that all those wishing to work have had jobs, and their pay must have been at least high enough to produce a tremendous buying power, and at the same time low enough to permit selling prices within the reach of that buying power.

Free Thinking Important to Progress

Surely it is significant that this progress was made under a carefully guarded non-interference-with-labor-governmental policy, also that while ranking first in industry and standards of living, the United States never exceeded sixteenth position in unionism, or did union workers in this country ever exceed approximately 4,000,000 and that at a time when there were about 48,000,000 people gainfully employed. One worker in 8 belonged to a union, now it is not even one in 10; this figure in spite of the fact that the Government was influenced by the A. F. L. to abandon,[1] two years ago, the long cherished *laissez-faire* policy and substitute the National Industrial Recovery Act with its much publicized Section 7a, a dignified statute of our Federal Government, worded so as to imply pointedly that employers generally have coerced, intimidated, and influenced workers against doing that which they have preferred to do. Neither Section 7a nor any other section seeks to prevent union organizers from coercing, intimidating, or falsifying to influence otherwise satisfied and well-treated workers into the paid membership of unions.

Cart-before-the-Horse Principle

The American Federation of Labor, as you will learn, has some very high-grade and laudable principles and objectives, but the realization of them depends on reforming the business structure and principles of distribution. This reforming cannot be done by any code scheme that has so far been devised, but if possible at all, more time, thought, and experience will be required than has been afforded in the past 1¾ years. Raising wages and reducing hours of labor, with resulting higher cost of products, faster than business and distribution principles can be reformed simply pave the



Graph 2

way for a constantly reduced demand for products with a proportionate reduction in the number of jobs. A higher wage rate is of little value to the individual unless it results in more dollars in the weekly pay envelope. It is actually a hardship if the price of food and clothing is increased, and this has actually happened, both because of higher wage rates and the reduction of the purchasing value of the dollar to approximately 59¢. Thus it can be realized that business managerial problems must be considered along with the question of wages and hours, and failure to do so is certain to result in less work and less pay, a condition the employer is just as anxious to avoid as is the worker, misguiding argument to the contrary notwithstanding.

That employers of the United States have always strenuously resented unionization has not been because they wished to keep labor in a condition that would permit exploitation, but rather to keep a proper balance of manufacturing costs and product distribution conditions. In other words they necessarily object to the methods and character of interference, when interposed by outsiders that are not corporately[2] responsible for the results of their acts, that disregard and depreciate the employer and his problems, and that often exploit the workers whose wage and condition the outsiders claim to benefit.

Rubber Industry Employment and Earnings

The situation of employment in the rubber industry as compared with that of all manufacturing (see Graph 1) shows clearly that economic conditions have affected the rubber industry employment a trifle more acutely and somewhat earlier than that of total manufacturing from 1923 to 1934 inclusive. This statement is true on both the downward and the recovery trends.

A conspicuously interesting fact resides in the favorable average weekly earnings of workers in the rubber industry during the past twelve years as compared with the industry in general. (See Graph 2.) Except in the very depth of the depression, 1932-1933, and during the August and September slump in 1934 earnings in the rubber industry were from a few cents to over $2 a week average per worker more than those in all other manufacturing combined; the higher differences prevailed during the majority of the time.

[2] *Monthly Labor Review*, Jan., 1935, pp. 38-43.
[3] "Ten Years with a Works Council." *Factory Management and Maintenance*, Jan., 1934, pp. 1-4; *Ibid.*, Feb., 1934, pp. 53-55.

Rubber Industry Employer Is Fair

Workers in the rubber industry are perhaps aware of the various and unavailing attempts of union organizers to obtain membership fees from them prior to the NRA, and Graph 2 will show that nothing has been gained since then that the employers had not given voluntarily in the previous ten years and will continue to do, no doubt, as business conduct permits.

Employers in the rubber industry have given serious attention, not just gestures, to matters affecting the welfare of workers and their families. Such beneficent projects, to name but a few, as pension, saving, and bonus plans; group insurance; mutual benefit societies; hospitals; schools; social clubs; and employe representative organizations[3] were not given by the employer because of compulsion, or without considerable expense, but strictly out of a desire to promote the best interests of those in partnership with him, and thereby their mutual interests.

A survey of the National Industrial Conference Board reported in December, 1933, that the workers of 3,314 manufacturing and mining concerns deal with management as follows: 45.7% individually, 9.3% through labor unions, and 45% through employe representation plans. The latter type has been particularly applicable to the rubber industry for many years and is worthy of consideration, if for no other purpose than as a means of studying in a thorough manner the kind of collective bargaining plan to adopt permanently for the workers' best ultimate interests.

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Distributers' Stocks of Waterproof Rubber Footwear

In the United States, March 1, 1935[1]

	Jobbers, Etc.		Independent Dealers		Retail Chains		Department Stores		General Stores	
	*No.	Prs.	*No.	Prs.	*No.	Prs.	*No.	Prs.	*No.	Prs.
Rubber boots	129	32,827	1,577	40,510	171	14,006	917	40,130	4,915	92,989
Lumbermans and pacs	69	11,928	911	26,136	98	16,729	422	10,366	2,319	59,075
Arctics and gaiters, heavy	82	23,664	1,526	47,280	148	23,999	721	32,775	4,084	110,450
Light	67	18,068	1,463	58,823	137	14,819	674	35,003	3,365	97,532
Style gaiters, cloth	40	9,213	1,041	65,051	83	8,399	477	22,144	2,278	60,866
Rubber	58	45,596	1,654	148,610	161	95,194	913	112,801	2,865	98,353
Rubbers	108	139,926	2,149	401,165	211	166,221	1,151	234,087	5,572	474,095
Total	170	281,222	2,276	787,575	241	339,367	1,282	487,306	6,529	993,360

*Number column does not add to total, in which duplications are eliminated.

AS A result of the survey of stocks of waterproof rubber footwear as of March 1, 1935, made by the Leather and Rubber Division with the cooperation of The Rubber Manufacturers Association, Inc., 11,786 distributers reported 3,611,363 pairs on hand, an average of 306.4 pairs per company, against 14,670 distributers with 4,867,370 pairs, or 331.8 pairs per company on March 1, 1934. The number of distributers reporting stocks of each class of rubber footwear, the number of pairs reported, and the average pairs per company, for the United States as a whole, are shown below for March 1, 1934, and March 1, 1935:

SUMMARY OF DEALERS' STOCKS OF WATERPROOF RUBBER FOOTWEAR

	March 1, 1934			March 1, 1935		
	No. of Dealers	No. of Prs.	Prs. Per Dealer	No. of Dealers	No. of Prs.	Prs. Per Dealer
Rubber boots	10,633	416,220	39.1	8,634	271,431	31.4
Lumbermans and pacs	4,990	231,737	46.4	4,229	156,418	37.0
Arctics and gaiters, heavy	8,474	381,185	45.0	7,237	312,397	43.2
Light	7,823	340,641	43.5	6,327	259,053	40.9
Style gaiters, cloth	5,686	239,791	42.2	4,336	178,337	41.1
Rubber	7,245	749,476	103.4	6,141	669,466	109.0
Light and heavy rubbers	12,670	2,508,320	198.0	10,216	1,764,261	172.7
	14,670	4,867,370	331.8	11,786	3,611,363	306.4

Taking the total number of distributers reporting stocks as 100%, the percentage reporting stocks of each class of footwear is shown below for March 1, 1932, March 1, 1933, March 1, 1934, and March 1, 1935. A study of the percentages shows that the proportion of dealers and stocks in each group was roughly comparable for the four dates.

COMPARABILITY OF MARCH 1, 1932, 1933, 1934, AND 1935 SURVEYS

	% of Dealers Reporting Each Class				% of Total Stock Reported for Each Class			
	1932	1933	1934	1935	1932	1933	1934	1935
Rubber boots	73.7	72.1	72.5	73.3	8.1	9.5	8.6	7.5
Lumbermans and pacs	37.7	36.5	34.0	35.9	3.4	3.2	4.8	4.3
Arctics and gaiters, heavy	61.1	59.2	57.8	61.4	8.6	9.4	7.8	8.7
Light	56.3	55.0	53.3	53.7	10.5	9.2	7.0	7.2
Style gaiters, cloth	46.2	42.3	38.8	36.8	8.9	6.7	4.9	4.9
Rubber	47.3	46.9	49.4	52.1	12.9	14.3	15.4	18.5
Light and heavy rubbers	86.0	86.3	86.4	86.7	47.6	47.7	51.5	48.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

[1] Circular No. 3,564, Leather and Rubber Division, Department of Commerce, Bureau of Foreign and Domestic Commerce, Washington, D. C.

The number of makes of rubber footwear handled by distributers is given below with comparable figures for the two previous surveys.

NUMBER OF MAKES HANDLED

	March 1, 1933		March 1, 1934		March 1, 1935	
	No. of Dealers	% of Total	No. of Dealers	% of Total	No. of Dealers	% of Total
One	4,174	35.1	3,822	34.1	2,918	35.4
Two	4,920	41.5	4,601	40.9	3,447	41.7
Three	1,796	15.1	1,812	16.1	1,231	14.9
Four	545	4.6	565	5.0	384	4.6
Five	201	1.7	202	1.8	139	1.7
Six	108	0.9	116	1.0	72	0.8
Seven and over	135	1.1	124	1.1	79	0.9
	11,879	100.0	11,242	100.0	8,270	100.0
Not reporting	4,073		3,428		3,516	
Total	15,952		14,670		11,786	

Information concerning the type of business conducted by those submitting reports was solicited in this survey for the first time. As a result statistics have been compiled showing stocks held by each class as below.

	Reports Received		Stocks Held		Average Prs.
Type of Business	No. of Distributers	% of Total	Reported Prs.	% of Total	per Distributer
Jobbers or wholesalers	170	1.4	281,222	7.8	1.655
Independent shoe dealers	2,276	19.3	787,575	21.8	346
Retail chain stores	241	2.1	339,367	9.4	1,409
Department stores	1,282	10.9	487,306	13.5	380
General stores	6,529	55.4	993,360	27.5	152
Not classified	1,288	10.9	722,533	20.0	561
	11,786	100.0	3,611,363	100.0	307

The number of distributers of each class reporting for each type of footwear is shown in the table above, across the page, together with the number of pairs reported; the firms not classified are omitted from this table.

The extent to which large dealers' stocks (over 999 pairs) affected the returns for each class of footwear in the current survey is indicated by the following statement of stocks reported by 306 firms in this group:

SPECIAL TABULATION OF DEALERS WITH LARGE STOCKS

	No. of Dealers	% of Total Dealers	Prs. per Dealer	No. of Pairs	% of Total Stocks
Rubber boots	258	84.3	367.1	94,724	7.2
Lumbermans and pacs	199	65.0	250.2	49,792	3.8
Arctics, heavy	253	82.7	479.4	121,280	9.2
Light	262	85.6	280.2	73,418	5.6
Style gaiters, cloth	188	61.4	318.4	59,850	4.5
Rubber	281	91.8	1,251.4	351,646	26.6
Rubbers	299	97.7	1,912.3	571,786	43.1
Total	306	100.0	4,321.9	1,322,496	100.0

The Foreman's Job

Cooperation Important in Foremanship

G. F. Buxton [1]

TODAY'S typical factory production is a complex affair managed by an organization of experts, with highly specialized production handled by trained operators and with supervision by a group of competent foremen. Work moves fast, and specifications must be followed exactly. Foremen work under pressure through a busy day. They meet many kinds of problems, some of which may not be to their liking and may seem to be of a type which could have been avoided.

The management cannot always take the time to explain every policy and every new move in detail with a full statement of the reasons back of each move. Foremen have to take for granted that there is a good reason for executive orders and suggestions. They have to feel confidence in executives who make the decisions and give the orders. There must be a spirit of cooperation between the foreman and his boss; a feeling of loyalty to the company and to its officers, on the part of the foreman; a willingness to support plant policies and regulations; and an interest in the company and an effort to make it a success, or there can be no success.

Meaning of Cooperation

The idea of working together agreeably is an essential of good foremanship. It implies a cordial attitude and a feeling of friendliness. Some folk are more expressive of this friendly attitude than others. Some find it easy to get on with people; while others find it more difficult. But everybody can develop more of the team spirit if he chooses to do so. We cooperate with others when we are interested in their points of view and their successes, when we are willing to fit our ideas into theirs, giving up some of our "pet notions" if necessary.

An entire factory personnel may be thought of as a team, all working together for one main purpose, the continued prosperity of the company. With the company's prosperity is tied up also the welfare of the organization of heads of the various departments and the welfare of the working force. As the company succeeds in keeping its customers and in making a profit in the business, it continues to operate and to keep the workers on its payroll. The foreman fits himself into the scheme of team work. He is a part of one team made up of members of the supervisory force, and he builds another team out of the employes in his own department.

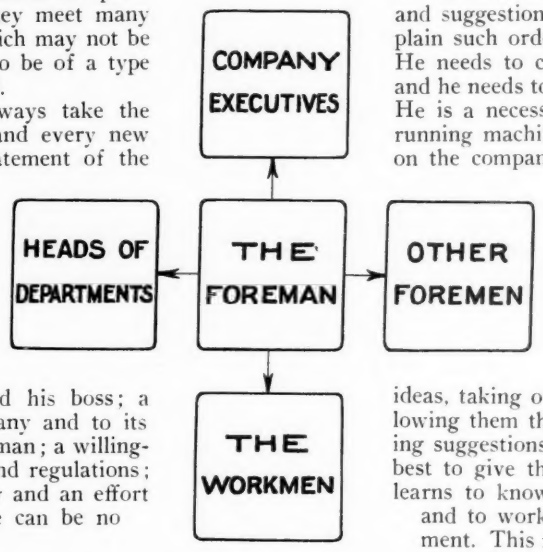
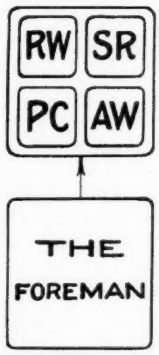


Fig. 1. Cooperation Upwards, Loyalty; Cooperation Sideways, Tact; Cooperation Downwards, Leadership



RW—Routine Work; SR—Shop Rules; PC—Possible Changes; AW—Attitude of Workers

Fig. 2. Cooperation with Management

A foreman always occupies a key position. His job is to understand and carry out company orders and suggestions. It is also to interpret or explain such orders and suggestions to his men. He needs to cooperate with the management and he needs to get the cooperation of his men. He is a necessary part of a piece of smooth running machinery made up of all the people on the company payroll.

Three Types

There are three types of cooperation for a foreman to have in mind. The first is cooperation with the management—supporting the plans of those in authority, carrying out other people's ideas, taking orders with the intention of following them through exactly as given, receiving suggestions with a willingness to do one's best to give them a chance to succeed. One learns to know his place in the organization and to work in harmony with the management. This is sometimes called "cooperation upwards."

The second type of cooperation is that with others in one's own plane of authority—with other production or maintenance foremen, with heads of departments in charge of production scheduling and control, employment and personnel control, records and cost control. There may be other minor executives with whom the foreman deals. This type of cooperation involves "working together in harness" with a give-and-take attitude. It demands patience and the making of concessions to keep things running smoothly between departments. It requires the handling of work in such a way that it will be convenient for those in charge of other departments in the factory. This is sometimes called "cooperation sideways."

The third type of cooperation is that with employes in the foreman's own department, who are working under his immediate direction and control. It involves the idea of leadership. It includes the necessary features of a forceful but agreeable personality on the part of the foreman, an ability to take command of a situation and to give the necessary orders, but to secure

[1] Professor of industrial training, Purdue University, Lafayette, Ind.

at the same time the ready response which is given to one who understands and shows an interest in his men. It implies the type of leader who makes himself a part of the team which he leads, one who works with his men as far as possible in overcoming new difficulties. This is sometimes called "cooperation downwards."

Cooperation is never a one-sided affair. It is at least two-sided. It may be many-sided. It requires two or more parties working together. But in this discussion we are speaking only of the foreman's part in cooperative efforts—upwards, sideways, or downwards. Regardless of the efforts of the other parties to cooperative effort, we are emphasizing here the part the foreman must play in gaining the harmonious interests necessary for the success of the business. There must always be some of the unselfish idea of working for the good of the company as a whole, without always asking: "What will I get out of this?"

Cooperation with Management

Stated in general terms, the field for the foreman's cooperation with the management covers an understanding and support of plant policies. It depends upon an interested grasp of the point of view of the principal executives of the company. There are many places in the rubber industry where this is absolutely essential. There are so many ways where production can go wrong, so many details that demand close and intelligent supervision, so many activities where the foreman must be informed and willing to follow instructions.

The field for cooperation with the management covers: the recognized and standardized system for routine work in the plant, to be followed carefully and continuously to avoid friction and confusion; shop rules and regulations, which seem desirable to the management and which are now in force although they may be subject to later modification at the suggestion, perhaps, of the foreman himself; those many little matters which come up from time to time indicating the management's interest regarding possible changes in methods, equipment, or personnel, which at first do not make any direct appeal to the foreman; problems affecting the attitude of the working force and having to do with matters of wage rates, pay incentives, reduced hours of work, and the introduction of labor-saving machinery.

A clear understanding of these matters, with a willingness to support the management in its various efforts, is an evidence of good foremanship. Misunderstandings may appear, and their solution may require a wholehearted interest on the part of the foreman, a tactful approach, and a clear interpretation of the management's point of view with reasons for the newly adopted policies. The foreman realizes the company's settled rules and regulations, and he comes to have a sympathetic interest in its suggestions and proposals as he gets to know the management better. There is usually no permanent success for a manufacturing organization without the full cooperation of the supervisory part of the organization. Foremen must assist in putting the company's schemes into practice.

Why Cooperate?

It would seem unnecessary to have any importance attached to the idea of cooperation in a modern, highly specialized, and highly organized factory in the rubber industry. It is a part of any well-organized factory to have everything planned and provided in advance and everything scheduled to arrive when needed and in proper condition for use. Orders will have been checked, set-ups made and tested, materials and work-in-process inspected, workers instructed, and production operations timed. Quality requirements will have been established and production speeds determined. Why then do we need the cooperation of foremen with the management? Why not simply expect him to do as he is told? Why the cooperative attitude?

In actual practice many little difficulties and delays arise. There are bad materials, broken tools, and mistakes in workmanship. There are misunderstandings and accidents. Sometimes inexcusable carelessness and even intentional bad work exist. There are sudden and inconvenient changes in orders and rush orders. Mistakes may be passed on from one department to another.

A foreman must continually adjust himself to these conditions and do his part toward correcting them. He has to be patient in dealing with mistakes which may be due to an incomplete executive control. He has to be quick in applying a remedy to minimize the results of mistakes. Surely nothing is gained by calling attention to an apparent failure of management in any situation.

A better attitude is to say: "Let's get back to normal production quickly and inconspicuously. I'll help do it."

Mistakes and misunderstandings and changes compel a foreman to make constant little adjustments and accommodations to meet expected human limitations.

Ways to Do It

Cooperating with the management is brought about in the following ways:

Figure out how to put yourself wholeheartedly into the company's established practice and into new ventures.

Get interested in what the company undertakes. Become enthusiastic if possible. Put your best energy into your part of the work.

Try to make the job a success. Cut out the "wet-blanket" habit. Do not get the point of view that the boss is probably wrong.

If your best effort is looked for, give it freely. Keep at it persistently until the job is finished.

If your honest opinion is asked, give it honestly, unhesitatingly, frankly, and fully.

If your opinion is not wanted, do not be in a hurry to volunteer it. The cooperative attitude may be worth more to the company than the expression of an unwanted opinion.

(*To be continued*)

Hard Rubber (Ebonite)

(*Continued from page* 35)

icals is well known. In this respect it is much superior to soft rubber. Aside from rubber solvents, such as benzene, carbon tetrachloride, and strong oxidizing acids, such as nitric and sulphuric, hard rubber may be said to be chemically resistant. The chemical resistance of hard rubber, however, is limited at temperatures above 65° C. (For further details consult footnotes 38, 18, 6, 39, 36, 23, 19, 31, 26, 37, 40, 22, 13, 35, and 41.)

(*To be continued*)

LAMINATED GLASS. The process of producing laminated glass comprising two or more sheets of glass and one or more non-brittle membranes consists in preparing a bond-inducing medium by first mixing rubber and gelatin in the desired proportions, then dissolving 10 to 20% of the rubber gelatin mixture in diethylene glycol, then applying this mixture to one or more of the laminations, arranging the laminations in proper superimposed relation, and subjecting the sandwich to the action of heat and pressure to produce a composite structure.

Retreading Patents

Joseph Rossman, Ph.D.

THE following abstracts of United States patents for third circle retreading, full circle retreading vulcanizers, recapping vulcanizers, and special retread molds continue the informative article begun in our April issue.

35. Hayward and Anderson, 1,404,120, Jan. 17, 1922. A steam vulcanizer comprises a set of independently mounted molds, each having a longitudinal heating jacket, a steam boiler for supplying steam to the molds, steam supply pipes detachably connecting the ends of the heating jackets in series with the boiler, and means for cutting off communication between the molds and the boiler preparatory to removing any mold of the set. A bead molding member is used which has a part to fit against one side of the tire bead and a clamping device to engage the opposite side of the bead and connected to the part thus to hold the member in position on the tire bead.

36. Drope, 1,404,942, Jan. 31, 1922. A vulcanizer has a hollow cylindrical sleeve, a plurality of comparatively thin washers of compressible material movably mounted thereon, a movable member mounted on the sleeve at each end thereof adapted to abut the end washers, and means for moving the members toward the center of the sleeve to compress the washers.

37. Reilly, 1,407,771, Feb. 28, 1922. A vulcanizer consists of a body having a vulcanizing face arc-shaped longitudinally to fit the tread of the tire circumferentially and adapted to be applied upon the tread when the tire is flat on its side face, a fuel compartment extending at the lower side from end to end of the body and following the arc thereof, and a heat deflecting hood formed at the longitudinal upper side and following the arc of the body whereby an opening is left opposite the vulcanizing face, and the heat arising from the fuel compartment is temporarily confined and a pocket of heated gas is formed previous to its passing away through the opening.

38. Greenwald, 1,409,095, Mar. 7, 1922. Tire vulcanizing apparatus has an arcuate vulcanizing mold with heat insulating strips on its ends, a heat conducting plate over each strip, and a non-conducting block on each plate.

39. Henry, 1,411,095, Mar. 28, 1922. A vulcanizer comprises an oven structure having a vulcanizing surface, a clamp coacting with the surface, means for respectively moving the clamp in two positions, and means for holding the clamp in its position of adjustment, the moving means embodying a gear, and a rack bar carried by the clamp and coacting with the gear.

40. Druse, 1,418,137, May 30, 1922. A mold comprises annular members having heating chambers, the members including curved walls which cooperate to define a cavity for reception of a tire casing, the curved walls and the inner walls of the annular members defining relatively sharp edges adapted to be engaged in the grooves between the body of a tire casing and the beads thereof, thereby to hold the casing positively in such a position that the beads of the tire casing will be disposed in the central opening of the annular members and out of alinement with the heating chambers.

41. Radford, 1,426,672, Aug. 22, 1922. A retread for tires comprises an outer tread strip, a cushion strip, and a breaker strip between the tread strip and the cushion strip embedded therein, the tread being decreasingly vulcanized from its outer face inwardly to a green inner face.

42. Kasson, 1,427,109, Aug. 29, 1922. An apparatus for retreading tires consists of a segmental mold having a concentric chamber in its tread portion and a space above the chamber, and in communication with the chamber and atmosphere, a liquid, such as paraffin, having a boiling point above the vulcanization temperature of rubber and adapted to overflow into the space when heated, means for heating a substantial part of the outside wall of the chamber to heat the liquid, and means for applying the necessary pressure to the tread.

43. Fredd, 1,428,428, Sept. 5, 1922. To vulcanize tires introduce an inflatable bag into the tire, admit air under pressure into the bag to inflate it, and then subject the compressed air in the bag to the action of heat to heat the air and thereby the bag.

44. Barney, 1,429,831, Sept. 19, 1922. A tire mold comprises a plurality of separable sections of different lengths and operable independently or in combination, and a shell adapted to be arranged in each section to decrease the size of the mold, each shell having a space adapted to carry heating fluid.

45. Clark, 1,435,279, Nov. 14, 1922. A vulcanizer has a concave bed and therein a plurality of longitudinally extending configuration forming members provided with grooves on the under surfaces and openings for communication with the grooves.

46. Holcomb, 1,436,041, Nov. 21, 1922. A tire vulcanizer comprises inner and outer longitudinally and transversely curved members of sheet metal, one of the members having angularly turned edges welded to the edges of the other member, and a supporting member having a portion secured to the outer surface of the outer member.

47. Williford, 1,445,428, Feb. 13, 1923. A device for retreading tires comprises a one-third circle mold with a steam chamber, an air bag of such contour as to engage a tire casing disposed in the mold from substantially the midpoint of one sidewall to an opposite point of its other sidewall, means for clamping the bag in the mold, the means including an arcuate plate, a plurality of bolts, and a plurality of supporting members adapted to receive the bolts and to engage the walls of the mold.

48. Bright and Brautigam, 1,448,481, Mar. 13, 1923. A vulcanizing system includes a boiler with a mold in the top thereof, a heating coil arranged in the lower portion of the boiler, a supply pipe connected with one end of the coil and having a regulating valve therein, and an outlet pipe connected with the opposite end of the coil and extending away from the boiler.

49. Haughey, 1,451,611, Apr. 10, 1923. A printing

vulcanizer includes a vulcanizing block having interior heating means and provided at the inner side with exterior printing means adapted to print on the exterior of a finished tire, and a clamp extending beneath and supporting the vulcanizing block in position to be applied to a tire and receiving the block and provided at its outer side with adjusting means and having an engaging portion projecting beyond the inner side of the block and cooperating with the adjusting means for holding an article in contact with the printing means.

50. Rohne, 1,453,889, May 1, 1923. A vulcanizer comprises a U-shaped arcuate housing formed of two longitudinal sections, a similarly shaped vulcanizing plate disposed therein and abutting shoulders in the housing at its front and side surfaces, and a plurality of heating elements carried by the plate on its exterior surface, the housing having a channel in which the heating elements are disposed.

51. Shaler, 1,459,555, June 19, 1923. A vulcanizer comprises a steam generator, a hollow casing permanently connected thereto and having a detachable portion, and end shoes adapted for detachable connection interchangeable with the ends of the stationary portion, or with one end of said stationary portion and with one end of the detachable portion, such shoes having means for insuring gradual variation of heat applied to the work adjacent the outer portion of the casing.

52. Conn, 1,463,872, Aug. 7, 1923. The combination with a thermally heated mold adapted to receive a tire casing, and an expansible core adapted to press the casing against the heated surface of the mold, of a temperature indicating apparatus comprises a curved thermocouple fitted between core and inner surface of the casing, and an electric circuit including the thermocouple and a temperature indicator.

53. Jones, Jr., 1,467,761, Sept. 11, 1923. The method of vulcanizing new treads on previously formed tires consists in subjecting the new tread to a vulcanizing heat gradually decreasing toward the sides of the tread, maintaining the tire cool interiorly during such vulcanizing, and insulating the exterior wall of the tire on opposite sides of the tread against the action of such vulcanizing heat.

54. Killmer, 1,477,267, Dec. 11, 1923. A vulcanizer has oppositely disposed molds hingedly connected together and adapted to operate upon a tire of one size, a liner attachment for each of the molds which in operative position form a substantially continuous liner surface for operating upon a tire of a different size, and means for detachably securing the liners in the molds.

55. Fitzharris, 1,483,857, Feb. 12, 1924. A segmental mold for curing tires comprises a core surrounded by a jacket composed of flexible walls, means to secure the walls together, a non-expansible shell about the jacket, and means between core and jacket to exert a radially outward pressure on the base of the tire beads.

56. Martin, 1,494,615, May 20, 1924. A tire mold comprises two semi-circular half-molds adapted to be locked together to form a complete circular mold, each half mold including an outer shell and two semi-circular channel irons hinged medially thereto, and means for drawing and locking the channel irons together laterally.

57. Brindlinger, 1,498,998, June 24, 1924. A vulcanizer for vulcanizing a portion of a tire includes a base, a core section fixedly connected to it and adapted to enter a portion of a tire to be vulcanized, hollow arms hinged to the base, hollow mold sections carried by the arms, and means for admitting steam to the hollow arms, the mold sections being adapted to enclose entirely the portion of the tire to be vulcanized.

58. Brooks, 1,522,493, Jan. 13, 1925. A tire mold comes in the form of a longitudinally curved trough divided into two parts along a longitudinal plane, the walls of the trough being hollow and so shaped that sections on the inner sides thereof at the bottom are spaced apart from each other when the two parts of the mold are placed together. The sections have alined openings therein; a stuffing box lies between the sections and is fitted into one of the openings, and a nipple is secured in the other of the openings and fitted slidably into the stuffing box.

59. Hughes, 1,524,866, Feb. 3, 1925. A tire retreading apparatus is made of abutting halved vulcanizer sections having an opening therethrough, and a mold adapted to fit within the opening consisting of matrices separable diametrically and circumferentially and bead rings separable circumferentially. The apparatus is provided with means for drawing the halved sections and mold together to form a continuous circular cavity for the retreading of a tire.

60. Gewert, 1,538,481, May 19, 1925. A vulcanizer comprises a pair of parallel disposed hollow sidewalls, a plurality of hollow tread molds adapted to be clamped between the sidewalls, lugs on the tread molds, the lugs being adapted to locate tread molds in the proper operating position between the sidewalls, and means for clamping the latter against the molds.

61. Burdette, 1,545,033, July 7, 1925. A device for treating vulcanizable material includes a chambered body portion for receiving fluid under pressure, a chambered nipple arranged in angular relation to the body portion and adapted to be embedded in the material, and an angulated injector nozzle having a portion arranged within the chamber of the nipple.

62. Semler, 1,548,215, Aug. 4, 1925. An apparatus for vulcanizing tires consists of a flexible metallic shell, a filling of heat insulating material in it, and a heating coil arranged in contact with its inner wall.

63. Matthews, 1,575,434, Mar. 2, 1926. In a tire vulcanizer a tire receiving mold has spaced side portions, means for applying pressure to a tire disposed within the mold comprising a member bridging the side portions of the mold and carrying a clamp screw for applying pressure, and means slidably connecting the member with the side portions of the mold to permit correct positioning of the screw with respect to a tire within the mold.

64. Nestler, 1,577,291, Mar. 16, 1926. An apparatus for retreading tires contains a casing, an air entrance tube projecting into the bottom of the casing, a deflector on the top of the tube larger in diameter than the tube, and a damper ring around the tube in the casing, the ring and tube having registering openings therein, means for moving the ring relative to the tube to vary the sizes of the air inlets, and a burner discharging its heat into the bottom of the tube.

65. Platt, 1,579,391, Apr. 6, 1926. A tire mold is adapted to contain a portion of a tire casing, bead engaging pressure members coacting with the mold, a rim with ends abutting the bead engaging members to form a complete annulus, and a tube adapted to fit within the tire casing.

66. Connelly, 1,579,518, Apr. 6, 1926. A full circle tire mold is provided with means to radiate the heat over the sidewall and bead portion of the mold to eliminate overcuring tire sidewall and bead during vulcanization.

67. Burdette, 1,579,641, Apr. 6, 1926. A method of retreading tire casings comprises yieldably supporting the tread portion of the casing against depression, positioning the tread elements upon the casing, binding the tread elements to the casing and simultaneously depressing the elements to permit relatively free flexing of the sidewalls

of the casing and tread portion yieldably to restrain them against return to normal position, forcing the tread portion and elements back to normal against the restraining influence, and vulcanizing the tread elements to the casing.

68. Rutherford, 1,583,799, May 11, 1926. Tire vulcanizing mechanism comprises a heating core of circular cross-section and means for holding a tire on the core comprising a pair of bead gripping members, each of which includes an inner portion embracing the inner wall of the tire and occupying the space between the core and the bead portion, and an outer portion embracing the outer wall of the tire, and means for drawing the gripping members toward each other.

69. Miller, 1,585,933, May 25, 1926. An apparatus for retreading pneumatic tires comprises a plurality of metal sections adapted to surround the tire, a one-piece tightening band separate from the sections and surrounding them, means to clamp the band tightly around the sections thereby to retain them in place, two pairs of eyelets and cooperating pins for retaining the sections in juxtaposition, a rim to hold the tire in position, and a tube maintained inflated during vulcanizing.

70. Eymael and Dall'Este, 1,588,100, June 8, 1926. An apparatus to retread worn tires effects the support of the tire in the mold by internal expansion of an extensible annulus placed inside the tire cover, such annulus being composed of a plurality of tubular elements movably connected to one another, and means for producing a circulation of cold air in the tube constituted by the annulus when expanded and closed by the expanding device, to prevent overheating of the canvas layers of the tire cover.

71. Nestler, 1,595,914, Aug. 10, 1926. A clamp for use in retreading tires comprises a saddle, means for connecting it to the mold, a yoke connected to the saddle, and a plurality of pressure feet engaged by the yoke.

72. Kerley, 1,599,534, Sept. 14, 1926. The method of reproducing a tire tread design in initial matrices for the production of a master pattern consists initially of obtaining an imprint of a design in a sheet of raw rubber from an unused tire by subjecting it to steam pressure thereon in a mold; then in removing the tire and rubber matrix thereby formed from the mold and curing the defects in the latter and replacing it in the mold; then in pouring a self-hardening, plastic composition into the mold to obtain a secondary pattern from the rubber matrix; then in removing the matrices thereby formed and replacing the secondary matrix in the mold; and finally in filling the space between mold and secondary matrix with molten metal to produce a master pattern.

(*To be continued*)

Saving Oil Wells with Rubber

F. R. Cozzens

IN THE crude oil districts of Ohio, West Virginia, and Kentucky rubber is being used two thousand feet underground to conserve producing wells. The majority of the wells in those districts were drilled prior to 1905, and over the course of years water, sludge, salt, sulphur, and other minerals have so corroded the casing that leaks are common. Of all these agencies fresh water is most destructive to oil bearing rock; and once its presence appears, the owner must act quickly to save his well. The menace is further complicated by the fact that leaky casing cannot be pulled and repaired; but after many years of experimenting, in which thousands of wells were lost, manufacturers came forward with a rubber packer that has solved the problem in practically every case. At least a dozen different types of this original packer are now available, and scores of other rubber products are rapidly taking the place of obsolete equipment in many fields.

When the presence of fresh water is now observed in a producing well, the modern operator obtains a casing packer. This product consists of a mat of soft gum-rubber wrapped tightly around a hollow metal core. The weight varies from fifty to one hundred pounds. After location of the leak has been determined, the packer is pushed down through the casing to a depth of ten feet below the leak. At that point it is anchored. Through a string of smaller pipe, corresponding to the inside diameter of the packer-core, oil is pumped from the well. Sediment and sludge, creeping down the leaky casing never reach the oil sand, but serve only to increase the packer's efficiency. Results are permanent, and the packer never needs replacement.

Another type of casing-packer, recently introduced, consists of two-inch soft rubber rings alternating with metal rings around a metal core of small diameter. This type is designed especially for deep wells and those where the casing has buckled from extreme pressure. Still another type is a tightly wrapped rubber band, which varies in length from ten to twenty feet and is held to its core by wire-mesh. The advantage of this type is that it can be withdrawn from the casing and reconditioned with rubber for future needs.

In many producing districts oil is now forced through the sands by compressed air pressure, and it often happens that a well "blows out" or wastes pressure until it cannot be pumped to advantage. When this condition occurs, the well must be flowed by air pressure, and here again rubber equipment plays a very important part. To flow the well it is necessary to confine air pressure to a small passage channel, and the customary way of doing this work is by forcing a tapered rubber plug down through the casing to a position just above the oil sand. The plug varies from three to five feet in length, and through its center is a hole one inch in diameter. A tubing of inch pipe extends from the surface of the sand, through the plug, and thence to the top of the well. At regular intervals a surface valve is opened, and the pressure of air lifts the oil up through the line and into the tank. In connection with this arrangement there is likely to be a casing head, made airtight by rubber gaskets, also a rubber casing-cup at the bottom of the well. Other important equipment used in connection with packers and plugs are: shims, valve packings, liners, jar absorbers, lifts, insulators, reducers, gum tape, and cement; all of which are made of rubber or of rubber composition.

Rubber products are now standard equipment in the majority of oil fields, and general check-ups show that both time and money are saved by their use. Rubber and rubberized composition materials stand up well under rigorous conditions, and they can easily be adapted by the workers to suit any oil field requirement.

EDITORIALS

The Future of Rubber Chemistry

THAT the rubber industry has been a laggard in technological research is the opinion of William C. Geer, the well-known rubber chemist.[1] He believes that a ten-year plan of cooperative research would result in greater markets for rubber products and more profit to executives who now face the law of diminishing returns in scientific investigations.

"A vast territory for applied research still lies open; to occupy it the compounder and designer must work together. Even if no more chemical knowledge should be given them, they will increase and improve vulcanized rubber products for factory, transportation, hospitals, and home. Rubber paints and varnishes, adhesives from crude, vulcanized, or isomeric rubber—these conceptions have not scratched the surface of its potential values. The comfort of automobiles may be enhanced by rubber instead of steel springs. Can tires be made without fabric (a well-known dream)? Latex use has only begun, and undoubtedly a larger tonnage will be employed. No attempt is made to list the possibilities.

"Such undertakings would merely be a continuation of present methods. Shall this industry continue to occupy itself chiefly with rubber as $(C_5H_8)_xS$ and its few unsolved chemical but many applied problems? Great as have been the achievements with respect to vulcanized rubber, from a chemical point of view they are comprised within a relatively narrow range, that of one chemical compound. Indeed, so thorough have these investigations been that were the research laboratories of the rubber industry to be closed, the high service now rendered by vulcanized rubber could continue for many years unchanged and a further number of new products, designs, and constructions perform useful service in human life."

[1] *Ind. Eng. Chem.*, April, 1935, p. 367.

Patent Rate Not Declining

ALTHOUGH official statistics show that the total figures for patents issued in the United States are just keeping pace with the population, Dr. Gilfillan,[1] in stating that the patent rate is declining, fails to consider that many older industries reach a static condition and do not take out patents for new inventions. New industries, however, make up for this loss by taking out a larger number of patents. Therefore the active industries, like rubber, are actually obtaining an increasing number of patents.

The important thing to note is the distribution of these patents into new developing fields where protection is necessary for the investment made in developing an invention from the experimental laboratory stage to final commercial success. The patent system is thus functioning exactly as intended, i.e., encouraging the development of new industries by offering protection to new inventions during their period of infancy. The constancy of the average number of patents in relation to population does not mean at all that we are not developing inventions faster, but it means that in spite of the tremendously large number of new developments we are still keeping up the same old pace in the quest of new rubber inventions.

[1] "Social Principles of Invention." S. C. Gilfillan, Ph.D., *Journal of the Patent Office Society*, Mar., 1935, pp. 216-34.

Loyalty Cannot Be Bought

"DURING the thirty-five years I have been responsible for Goodyear's relations with its employes, there has existed an outstanding spirit of cooperation, peace and harmony between the management and Goodyear men and women." Thus speaks Paul W. Litchfield in *The Wingfoot Clan.*

"I have considered it the duty of management to coordinate and harmonize the positions of stockholders, employes and our customers so that the interests of all three might best be served.

"It must be apparent to all Goodyear men and women, as well as to stockholders and management, that a discontented labor force would not be loyal, and if not loyal it could not be efficient.

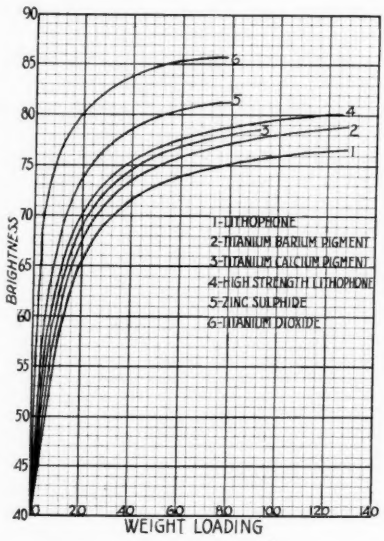
"Loyalty cannot be bought. It can only be earned through fair treatment. It has been our policy to try to earn the loyalty and cooperation of Goodyear men and women by giving them all we consistently could, with justice, in the way of wages and working conditions.

"We cannot hope to make good on Utopian dreams or fulfill the fantastic promises of self-seeking, irresponsible agitators. However, we can and have sincerely endeavored to pay the highest wages and provide the best working conditions possible in the industry.

"I have implicit confidence in the common sense, judgment and cooperation of both the employes and those connected with the factory management of Goodyear. I am confident that the peace, harmony and cooperation that have so long existed in our organization will continue and strengthen."

What the Rubber Chemists Are Doing

Tinctorial or Brightening Properties of White Pigments in Rubber[1]



INCREASING use of Titanium pigments for production of white and light tinted rubber stocks has resulted in considerable speculation as to their tinctorial or brightening powers as compared to other white pigments. As no report covering any systematic study of these features of white pigments has been found in the literature, a series of investigations was undertaken to establish relative positions in this respect.

Only through utmost care in preparing and handling the experimental stocks has it been possible to secure results sufficiently uniform to warrant comparisons of the brightening powers of the pigments considered. The procedure described below was finally adopted and has proved satisfactory.

A master batch of unpigmented rubber, sufficient for all the tests, was prepared, and slabs from this batch were tested for uniformity of brightness. A master batch was then prepared for each pigment series, using the maximum loadings under consideration, and portions of these master batches were diluted to the various test loadings with the unpigmented rubber. To insure against change in color of the unpigmented rubber during the period of the test, slabs of the portions used in diluting each pigmented master batch were again prepared and tested for brightness. After dilution of the pigmented master batches four slabs representing each loading investigated were tested for brightness.

The base compound used above was:

Pale crepe	100.00
Sulphur	3.00
Captax	0.75
Stearic acid	3.00
Zinc oxide	5.60

All test slabs were press-cured for sixty minutes at twenty pounds; previous work showed this cure satisfactory with the pigments being considered. Parchment was used on one face of the mold; the other face was polished, chromium plated copper.

Brightness readings in the red, yellow, and green regions of the spectrum were made by means of the Pfund colorimeter. Good check readings were obtained in practically all instances, and the averages for the four slabs representing each loading are used in the following. As a further check, selected slabs were submitted to an independent laboratory especially equipped for work of this nature. The findings were in excellent agreement.

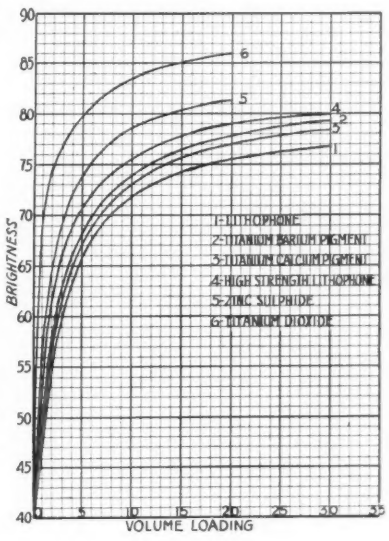
The pigments tested and volume loadings used were as follows:

Lithopone	5-10-15-20-25-30 volumes
Titanium Barium Pigment	5-10-15-20-25-30 volumes
Titanium Calcium Pigment	5-10-15-20-25-30 volumes
High Strength Lithopone	2½-5-10-15-20-25-30 volumes
Zinc Sulphide	2½-5-7½-10-12½-15-17½-20 volumes
Titanium Dioxide	1-2-3-4-5-7½-10-12½-15-17½-20 volumes

With low pigment concentration reflection in the red region of the spectrum is considerably higher than in either the yellow or green region. However the samples are whiter as they increase in brightness, and with increasing pigmentation reflections in the yellow and green regions approach that found in the red.

It was considered preferable to compare the brightening or tinctorial powers of the pigments in the yellow region of the spectrum as this region most nearly approaches that observed by the eye.

Examination of the weight and volume loading curves and experimental data shows that the maximum brightness procurable with the composite-type pigments does not approach that which may be obtained with the pure pigments. Consequently, in order to judge the relative brightening powers



of all the pigments, it is necessary to make comparisons at brightness levels well below the maximums procurable. Such a comparison is made in Table 1.

TABLE 1. LOADING (PARTS PIGMENT PER 100 POUNDS RUBBER)

Pigment	70% Brightness	75% Brightness
Lithopone	32.0	78
Titanium Barium Pigment	25.5	50
Titanium Calcium Pigment	21.5	43
High Strength Lithopone	18.5	37
Zinc Sulphide	13.0	23
Titanium Dioxide	4.0	9

Brightness data for the individual pigment series are appended.

BRIGHTNESS DATA

Volume Loading	Equivalent Weight Loading	Filter: Red %	Yellow %	Green %
Lithopone				
0		46.0	37.0	35.5
5	21.5	72.0	66.5	64.0
10	43.0	76.0	72.0	70.8
15	64.5	77.5	74.2	73.5
20	86.0	78.0	75.5	74.0
25	107.5	78.5	76.0	75.0
30	129.0	78.7	76.5	76.0
Titanium Barium Pigment				
0	...	44.0	37.0	35.0
5	21.5	74.5	68.5	65.0
10	43.0	77.0	73.5	71.2
15	64.5	80.0	76.0	76.0
20	86.0	81.5	78.0	77.0
25	107.5	82.0	79.0	78.0
30	129.0	82.3	79.0	78.3
Titanium Calcium Pigment				
0	...	44.0	37.0	35.0
5	15.5	73.0	67.0	66.0
10	31.0	76.0	73.2	71.0
15	46.5	78.5	75.5	73.0
20	62.0	80.0	77.0	74.5
25	77.5	81.7	78.0	77.0
30	93.0	81.5	78.0	76.2

[1] Data from Titanium Pigment Co., 111 Broadway, New York, N. Y.

BRIGHTNESS DATA (Cont'd)

Volume Loading	High Strength Equivalent Weight Loading	Red Filter %	Yellow Filter %	Green Filter %
0	...	46.0	38.0	35.5
2.5	10.5	70.0	64.8	63.8
5	21.0	75.5	71.0	70.0
10	42.0	77.7	75.5	74.3
15	63.0	79.0	77.7	76.8
20	84.0	80.2	79.0	78.0
25	105.0	80.5	79.5	78.7
30	126.0	81.0	80.0	79.0
	Zinc Sulphide			
0	...	44.2	37.0	35.0
2.5	10.0	71.2	67.0	65.0
5	20.0	77.3	73.8	71.0
7.5	30.0	80.0	77.5	76.0
10	40.0	81.7	79.0	76.8
12.5	50.0	82.2	79.8	77.5
15	60.0	82.8	80.3	79.3
17.5	70.0	82.3	80.8	79.3
20	80.0	82.8	81.2	80.5
	Titanium Dioxide			
0	...	46.7	37.0	35.7
1	3.90	74.0	69.3	67.2
2	7.80	77.7	74.5	72.5
3	11.70	80.5	77.0	74.7
4	15.60	82.7	79.0	77.7
5	19.50	83.7	80.2	79.5
7.5	29.25	84.0	82.2	81.0
10	39.00	85.5	83.5	82.2
12.5	48.75	86.7	84.7	83.5
15	58.50	87.7	85.5	84.7
17.5	68.25	87.8	86.0	85.2
20	78.00	87.8	85.7	85.0

Artificial Aging of Rubber

"THE perfect aging test has not yet been devised, the methods so far proposed all failing completely to maintain a balance between the members of a complex group of factors which collectively influence the stability of rubber."

This is the terse conclusion expressed by H. Jackson[1] after ably summarizing and correlating the results of capable research workers who for many years have been endeavoring to find a means of quickly measuring the probable life of rubber compounds and manufactured rubber articles.

From the complicated causes, "The instability of soft vulcanized rubber may be attributed generally to three causes, namely, modifications in the colloidal structure of the compound, 'after vulcanization' effects, and oxidation," the author carries the discussion through the known chemical reactions of aging and the artificial means of attempting to simulate them to the further conclusion: "In general, the main value attached to the tests is that they are strictly standardized instruments for partially gaging the response of rubber compounds to some of the chief ravages of natural exposure, and in the hands of an experienced investigator can be used to immense advantage by giving in a short space of time indications which otherwise would take months or years to obtain. To the manufacturer this amounts to being able to obtain quick and reliable information on known compounds regarding any defects in manufacture, state of cure, or the inadvertent inclusion in the compound of some deleterious ingredient. As a consumers' test on unknown rubber the information is unreliable."

[1] "The Artificial Aging of Rubber," H. Jackson, *Trans. Inst. Rubber Ind.*, X, 4, pp. 292-307.

A. C. S. Meetings

Rubber Division

THE American Chemical Industries Tercentenary was memorialized by the eighty-ninth meeting of the American Chemical Society held in New York, N. Y., April 22 to 26, 1935. About 450 technologists were present for the Rubber Division activities covering the first two days.

The program opened with Thomas Midgley, Jr., reviewing the important part rubber and rubber technologists have taken in the progress of the three-hundred-year-old American chemical industry. Instructive papers with discussions were given in order as follows:

"The Molecular Weights of Natural and Synthetic Rubber by the Svedberg Ultracentrifuge." E. O. Kraemer and William D. Lansing.

"Reenforcement of Rubber by Pigments. I. Effect of Moisture on Measurements of Heat of Wetting of Gas Blacks." C. W. Walton and H. J. Osterhof.

"A Fatigue Cracking Test for Tire Tread Compounds and Some of the Laws of Fatigue." E. T. Rainier and R. H. Gerke.

"Mixed Reenforcing Pigments in Rubber. I. Effect of Binary Mixtures of Zinc Oxide, Channel Black, and Clay upon the Physical Properties." O. D. Cole.

"Heats of Reaction of the System Rubber-Sulphur." A. T. McPherson and Norman Bekkedahl.

"Studies on the Variability of Plantation Rubber." A. E. Warner.

"The Carbon and Hydrogen Content of Hard Rubber." H. L. Fisher and Y. Schubert.

"Consumers' Crude Rubber Requirements." George A. Sackett.

Edgar Rhodes, chief chemist, Rubber Research Institute, Kuala Lumpur, F.M.S., most interestingly revealed the many factors contributing to the troublesome property variations in rubber and explained the nature of efforts toward further improvement, concluding with the suggestion that plans be effected for American technologists to work with R.R.I. on this mutual problem.

The instructional phase of the program ended with a trip to the United States Rubber Products, Inc., and the Okonite Co.'s mechanical rubber plants in Passaic, N. J.

About four hundred rubber men attended the recreational feature of the meeting April 22 at the Casino de Paree, which was reserved for the entire evening with the New York Group acting as host. The events began with the drawing of more than 160 valuable prizes ranging from fountain pen sets to exquisite pieces of luggage, which were contributed directly or in the form of cash by the many friends and members of the New York Group.

At the tables the diners found a variety of novel and useful table favors, which were also contributed and appropriately credited, and in addition appeared a unique and especially befitting souvenir program donated by the New York Group. It consisted of a booklet, the cover and leaves of which were thin sheets of vulcanized rubber bound together with a decorative blue and gold Lastex cord. The blue cover was artistically designed and embossed with gold colored rubber ink; while the gold colored leaves set forth their respective messages of "menu" and "entertainment" with rubber ink of blue color.

During the dinner and continuing long after Jimmy "Schnozzle" Durante with a background of Casino de Paree beauties added much to the spirited animation of the rubber revelers.

The Nichols Medalist

THE Nichols medal dinner in honor of Father Julius A. Nieuwland, C.S.C., University of Notre Dame, was held at the Hotel Pennsylvania, April 23. Following the dinner Dr. A. W. Hixson, Professor of Chemical Engineering, Columbia University, introduced the speakers. Father Eugene P. Burke, C.S.C., University of Notre Dame, delivered an interesting and witty address that clearly revealed the simple humanity and scholarly attainments of "Nieuwland, The Man." E. R. Bridgwater, rubber chemicals division, E. I. du Pont de Nemours & Co., spoke on Father Nieuwland's fundamental research in the chemistry of acetylene reactions. The Nichols medal was then presented to the medalist, who eloquently expressed his great appreciation of the honor conferred upon him.

Binney & Smith Entertain

BINNEY & Smith Co., 41 E. 42nd St., New York, entertained 250 rubber chemists and technicians April 23 at the Hotel Pennsylvania where the Nichols medal was presented to Father J. A. Nieuwland, C.S.C., University of

Notre Dame, for outstanding research in the chemistry of acetylene compounds. The after-dinner party, which included a superior cabaret entertainment, took place in the Cascade Room at the Biltmore Hotel.

Akron Group

THE Akron Group, Rubber Division, A. C. S., held its spring meeting at The Akron City Club on April 12. This pleasant affair attracted 190 members and guests. The speaker of the evening was W. B. Wiegand, director of research, Binney & Smith Co., 41 E. 42nd St., New York, N. Y., who gave an informal and entertaining talk on his trip to the Far East. Interesting slides and several motion pictures also were shown.

A short business session also was held, during which Secretary-Treasurer H. A. Hoffman reported the Group is in good financial standing and had a record attendance during the past year. Then came the annual election of officers, with the following results: president, A. Brill, Republic Rubber Co.; vice president, Enos Baker, Binney & Smith Co.; and secretary-treasurer, G. Lloyd Allison, B. F. Goodrich Co.

Chicago Group

THE Chicago Group, Rubber Division, A. C. S., will hold its spring meeting at The College Inn of Hotel Sherman, Chicago, Ill., May 10. S. Collier has arranged an excellent program and will preside as chairman. H. A. Winkelmann, of The Marbo Products Corp., will discuss "New Developments in Rubber Research;" and J. C. Nichols, famous amateur hunter, will talk on "Hunting Whales and Animals in Alaska" and will also show motion pictures of the hunts. Additional features will be arranged and announced at the time of the meeting. Reservations at $1.50 per plate should be made with Ben W. Lewis, secretary of the group, c/o Wishnick-Tumpeer, Inc., 365 E. Illinois St., Chicago, Ill.

Boston Group

THE preliminary announcement in April of the spring meeting of the Boston Group, Rubber Division, A. C. S., is confirmed and supplemented by the following definite announcement by the group secretary-treasurer.

Members and friends of the group will meet at the University Club, 40 Trinity Place, Boston, Mass., May 17, with dinner at 6.30 p.m. Dinner tickets are $1.25 to members and $1.50 to nonmembers. They are to be had from W. J. R. Hauser, Secretary-Treasurer, Heveatex Corp., Melrose, Mass.

As previously indicated, Peter P. Pinto, editor of *The Rubber Age*, New York, N. Y., will deliver his very interesting illustrated lecture on "Strange Patents;" and C. E. Maynard, factory manager, Fisk Rubber Corp., Chicopee Falls, Mass., will talk on "Machine and Process Development."

Costing Pile Fabric Sizing

DETERMINING the material cost of rubberizing pile fabrics with latex compounds should involve accurately costing the wet compound, recording the total amount used during a given period of time, then applying the total extended cost against the number of square yards produced in that same period. This method is more comprehensive than that of calculating cost from the increased weight of the finished fabric because the former includes all waste ends; whereas the latter does not.

The manner of compiling the wet cost[1] is portrayed in the following table, which sets forth the computations for all typical constituents in each of the three intermediate batches that are finally combined to produce the sizing mixture.

COST OF COMPOUNDS FOR RUBBERIZING PILE FABRICS

Chemical paste	Lb.	Cost/lb.	Total cost
Water	70.6	$0.000	$0.000
Zinc oxide	16.2	0.080	1.296
Sulphur	5.4	0.025	.135
Zinc dimethyl-dithiocarbonate	2.3	3.000	6.900
Mercapto benzothiazole	2.7	0.550	1.485
Di-beta-naphthyl-para-phenylene-diamine	2.7	1.400	3.780
Sub-total	...	....	13.596
Freight	...	...	0.110
Total	100.0	$0.137	$13.706

Filler paste	Lb.	Cost/lb.	Total cost
Water	440	$0.0000	$0.000
Caustic	4	0.0415	0.166
Clay	300	0.0033	0.970
Whiting	185	0.0066	1.210
Chemical paste	71	0.1370	9.727
Casein	6	0.1380	0.828
Sub-total	...	....	12.921
Freight	...	....	1.620
Total	1,006	$0.01452	$14.541

Latex compound	Lb.	Cost/lb.	Total cost
Latex	400	$0.0780	$31.20
Karaya gum	40	0.0038	0.15
Dye	5§	0.8800	0.55
Filler paste	650	0.0145	9.43
Sub-total	...	....	41.33
Freight (latex)	...	....	1.30
Total	1,090	$0.0390	$42.63

Square-yard quantity and cost

Square yards produced (month)	35,136
Pounds compound used (month)	57,136
Average lb./sq. yd. (month)	1.63
Average cost sq. yd.	$0.0634

[1] "Application of Latex." John F. Hotchkiss, *Textile World*, Mar., 1935, pp. 666-67.

SAFETY IN THE PRODUCTION OF SEAMLESS DIPPED GOODS. *Gummi-Ztg.*, Mar. 15, 1935, pp. 261-62; Mar. 22, pp. 285-86. (To be continued.)

New York Group

THE New York Group, Rubber Division, A. C. S., will hold its annual outing on June 15 at The Alps Castle, near Paterson, N. J., where the facilities for golf, swimming, tennis, and field sports are excellent. There will be a soft ball tournament in which teams from several rubber companies will compete. A handsome trophy has been donated by INDIA RUBBER WORLD.

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FROM THE ANCIENT HISTORY OF THE MANUFACTURE OF SPONGE RUBBER. I. P. Kohler, *Kautschuk*, Mar., 1935, pp. 46-48. (To be concluded.)

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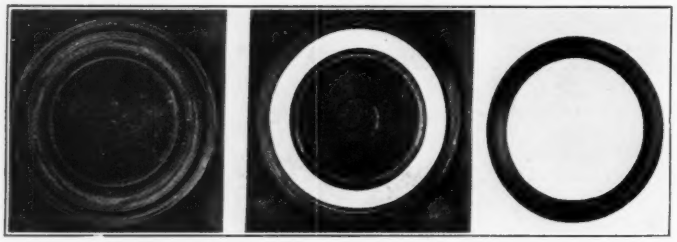
(*Continued on page 62*)

New Machines and Appliances



Molded Ring and Flash Flash Trimming Trimmed Ring

Molded Goods Trimmer

MOLDED rubber articles of many styles and shapes that require both inside and outside trimming have heretofore been troublesome and costly to finish properly. The improved Morris trimming machine is designed to do such work with high speed regardless of whatever the shape or the size of the article may be.

The accompanying illustrations show the various stages of finishing a ⅞-inch sectional diameter ring: first, with inner and outer flash attached as exists when stripped from the curing mold; second, the inner and outer flash after the ring has been cut out and removed; and third, the finished ring free of flash and trim marks. T. W. Morris, 6312 Winthrop Ave., Chicago, Ill.

Powdered Scrap Rubber

POWDERED rubber fine scrap is prepared for mixing in new composition in proportions up to 50% of scrap for molding new goods by a very efficient small mill of special construction. This mill weighs only 750 pounds and is operated by a 6 h.p. motor. It is water cooled and automatically fed and produces from 100 to 120 pounds per hour of fine powder in a single operation, the screen analysis of which is approximately as follows:

	Mesh	%
Through	100	18
Through	80	20
Through	60	39
Through	40	22
On	40	1
		100

With special presses molded rubber goods can be made with scrap powder without the addition of other material. Roca & Guix, Barcelona, Spain; M. Pancorbo, 155 John St., New York, N. Y., selling agent.

Laboratory Mill

THE 6-inch by 13-inch laboratory mill pictured features the drive contained within a high base to conserve floor space and at the same time to provide a convenient working height of 3 feet 10 inches from the floor to the top of the rolls without the necessity of mounting the mill on a table or other sub-structure. The mill is driven by a gear motor with the drive pinion mounted directly on the output shaft, thus eliminating any separate reduction gears. With the gear motor located in the base of the unit, the overall length is approximately half that required for units with the motor and drive mounted in line on the same level as the mill.

This laboratory mill has the usual equipment found on larger mills for factory use, including chilled iron rolls, well proportioned housings, cut spur connecting and drive gears enclosed in sheet metal guards and running in oil. A new feature on laboratory mills is the automatic guides which are self-adjusting with the adjustment of the rolls. The adjusting screws are also provided with vernier scales to indicate the exact setting of the rolls. A safety trip over the rolls operates a magnet disk brake built into the motor for quick stopping in case of emergency. The base of the unit is of welded steel construction. Farrel-Birmingham Co., Inc., Ansonia, Conn.

Detreading Machine

THE possibilities of economizing labor in retreading tires resides principally in the preparatory operations. The requirements of these depend on the manner and cleanliness of tread removal as well as the condition of the tire resulting from that operation. With the recently developed detreader, herewith pictured, the tread or sidewall of any size of tire can be quickly and completely removed, leaving the tire surface even, but roughened to require little or no subsequent buffing or repairing.

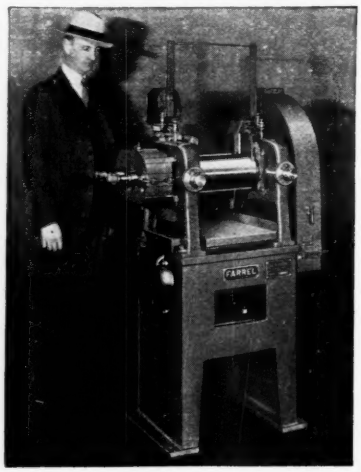
This machine consists of a strong boxlike cast frame or housing, within which is the complete mechanism to drive electrically the adjustable tire carrying chuck. Rigidly fastened to and extending from the exterior of this housing is a sturdy steel beam structure with movable carriages that support the operating lever with its cup-shaped, corrugated cutting knife.

Foot braking of the hand rotatable tire holding chuck provides a suitable means for applying camelback to the cemented tire; while pressure stitchers, interchangeable with the tread cutting mechanism, permit a quick, easy, and positive means of rolling down the tread. The Akron Standard Mold Co., Akron, O.

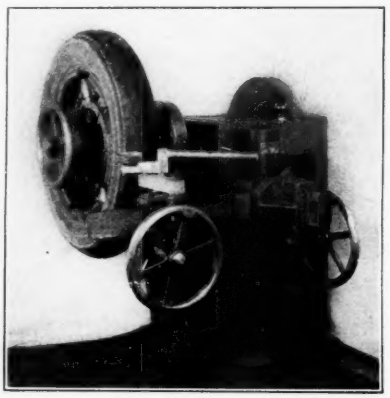
Band Cutter

THE automatic motor driven band cutter pictured has a cutting capacity from 200 to 700 stationers' bands per minute, depending upon their width. The machine is 53 inches long, 24 inches wide, 46 inches high, and has 3 revolving knives, 9 inches wide cutting on an angle with a shearing motion against a stationary knife fastened to the bed of the machine.

The shaft in the head is mounted



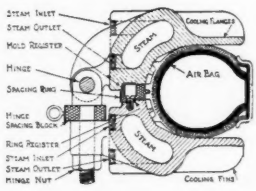
Farrel-Birmingham Laboratory Mill



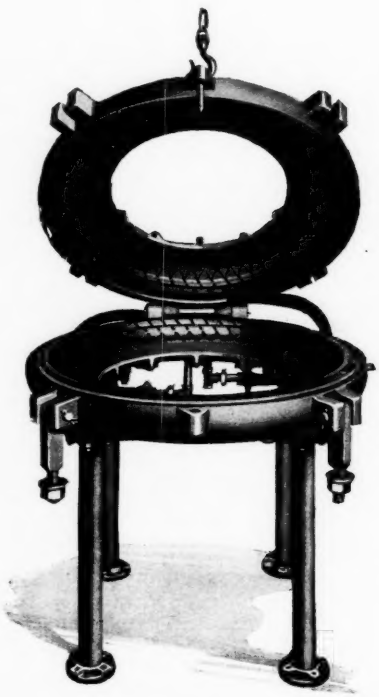
A. S. M. Co.'s Detreader

on ball bearings. The feed mechanism is driven from the head shaft through a specially constructed drive with feed changes giving 8 widths of cuts from ⅛-inch to one-inch. An important feature is that the band stock does not feed while the knife is cutting. The machine has 6 adjustable guides so that 5 rows of bands can be cut at the same time.

Thropp Automatic Band Cutter

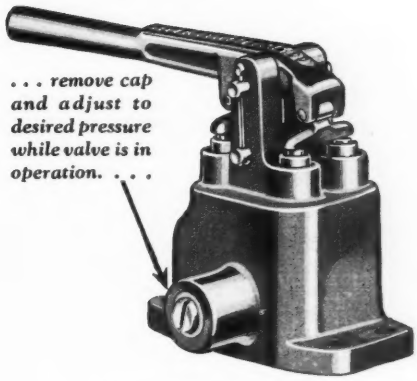


Tyrwelder Section



Akron Tyrwelder

Morrow High Pressure Oiler



Ross Operating Valve

The main feed rollers are gear driven, and pressure is held on the top roller by springs with adjustable bolts. Ahead of these rollers is a smaller one that holds the stock down when the knife is in motion. The motor is ½ h.p., 110 or 200 volts, single phase, and variable speed with switch providing overload protection and completely wired.

All moving parts are enclosed by steel electrically welded. That over the cutting head is removable. On the change gears for the feed the lower half of the guard is fastened to the machine and is arranged to hold oil for lubricating the gears and feed mechanism. The top half is removable by special bolts for changing gears. Wm. R. Thropp & Sons Co., Trenton, N. J.

Full Circle Tyrwelder

THE new Tyrwelder full circle retreading vulcanizer, illustrated herewith, is one of six sizes with simple hinge block and spacer ring adjustments that will properly accommodate all sizes of passenger tires and those of trucks up to and including 32x6 H.D. The vulcanizer is horizontally imposed at a convenient working height with an adjustable hinge at the rear connecting the two halves, which close with positive register.

A steam circulating cavity, shown in the cross-sectional view, with independent inlet and outlet connections, is cored into the tread region of each "en bloc" mold-half casting. An extension forms the sidewall cooling flange, which is relatively thin and jutted with fins to protect the sidewall from overvulcanization.

Die castings and separate metal inserts are avoided by cutting the standard or special non-skid design directly into the metal of the casting after the principle used in individual new tire vulcanizers. The Akron Tyrwelder Co., Division of The Akron Equipment Co., both of Akron, O.

Pressure Lubricator

THIS amazingly simple oiling tool will put any grade of oil any place that oil is required. A hand operated device, it is scientifically constructed. All active parts are of brass or steel and are machined to insure precision accuracy.

The principal feature of this high pressure lubricator is the patented, compressible, oilproof composition tip. Pressing this against the oil hole or fitting makes an airtight contact and insures perfect action. Pressure as high as 500 pounds can be secured by pressing the plunger at the bottom of the can. Generally, long before this pressure is reached, the oil may be seen coming out from the ends of the bearing. This condition indicates that the entire inside surface has been thoroughly lubricated.

The lubricator may also be used to loosen caked or corroded grease. By using a flushing oil and working the plunger rapidly the oil is driven through the bearing, loosening and carrying away the sticky substance. Morrow Mfg. Co., 1453 W. Van Buren St., Chicago, Ill.

Two-Pressure Air Valve

THE actual pressure required for the idling stroke of a piston in a cylinder is in most cases much less than that required for the work stroke. Based upon this principle, the two-pressure operating valve pictured provides for full line air pressure on the work stroke and selected reduced pressure, that is easily set or adjusted after the valve is installed, for the return or idling stroke. This difference in pressure is an appreciable saving in the amount of air consumed.

These valves are identical with the manufacturer's standard four-way valves, with the addition of a built-in reducing valve which can be regulated from zero to full line pressure for the idling stroke. Their design is such that pressure reduction is accomplished in one supply chamber only, without choking or throttling the exhaust.

These valves can be set and sealed against tampering until pressure change is desired. The effective savings are not probabilities, but actualities, easily and accurately measured while the valve is in operation. Ross Operating Valve Co., 6488 Epworth Rd., Detroit, Mich.

New Goods and Specialties

Trout Lake Club Lure

Soft Rubber Bait

TO SATISFY the demand of fishermen who want a pliable bait that looks and feels like a real fish, Globe Rubber Works, Inc., 45 High St., Boston, Mass., has created the Trout Lake Club lures. These are of rubber in colors said not to fade, peel, chip, or crack. They are also claimed to be tough enough to stand much use. They come in eight fish styles and three sizes in the fresh water line and three styles and two sizes in the salt water bait. An outstanding feature of all these lures is the exclusive "controlled action" mounting which is positive and easy to use. A simple bend or twist holds a flashy spin, wobble struggle, or dive during trolling.

The firm has also developed a new rubber covered plug which has a tough, tight overcoat of colored pure gum rubber with not an ounce of enamel or paint to fade, peel, chip, or crack. Also offered for the "compleat angler" are soft rubber worm baits mounted on imported hooks.

Teeth Protector

LEADING boxers and athletes indulging in their fast and furious sports run the risk of having their teeth knocked out unless they are adequately protected. One device for this purpose, illustrated herewith, is fashioned of white Para rubber said to be not affected by climatic conditions or hot or cold water. This protector is made to fit any mouth, upper or lower teeth. Wilson-Western Sporting Goods Co., 2037 Powell Ave., Chicago, Ill.

Novel Playthings

ATTRACTING attention on toy counters are the Goo-Goo dolls and ducks. Made of thin, pliant rubber, when squeezed, these creations give forth a strange sound while the head swells to alarming proportions. The doll model has a painted snub nose and saucer-like eyes. The other style features the head of a duck. Thornecraft, Inc., 4311 Ravenswood Ave., Chicago, Ill.

"Pluto the Pup"

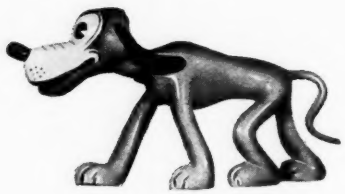
ANOTHER new molded character, "Pluto the Pup," has been added to the "Walt Disney" line of rubber,

stand-up type of dolls manufactured by Seiberling Latex Products Co., Akron, O. Of solid, molded construction, this new toy is approximately 7½ inches long and 4 inches high. Its body is furnished in a new "china glaze" finish, in either brilliant yellow or red, with features fully decorated in black and white.

Licensed exclusively to manufacture "Walt Disney" characters in rubber, Seiberling employed well-known sculptors to design each character. Working closely with Walt Disney Enterprises, they achieved attractive, lifelike reproductions of the famous film folk. The "Three Little Pigs," "Big Bad Wolf," and "Mickey Mouse" made their appearance some time ago and have been in big demand ever since.

Rubber Protector for Teeth

M.S.A. Comfo Respirator



New Molded Character

Rubber in Respirator

DUST is one of our more prevalent industrial hazards existing in greater or lesser degree in most industries. Many devices, consequently, have been perfected to protect the workman from the dangers of breathing dust.

One such product, here illustrated, is the M.S.A. Comfo Respirator, which features a rubber face piece, aluminum filter cases, and U. S. Army gas mask type of exhaustion valve. The rubber and the aluminum may be washed and disinfected at any time without risk of corroding the metal. The complete respirator, which weighs only 4.8 ounces, can be worn in entire comfort, it is claimed, and is easily and quickly adjusted to the head.

Maintenance of the Comfo Respirator requires the renewal of filter disks as they become impregnated with dust, which is indicated by a gradual increase in breathing resistance. The perforated lids of the filter cases are unscrewed; the old filter disks removed, and new ones inserted; then the lids are screwed back in place—a simple, speedy operation that any workman can perform. Length of service of filter disks depends largely on the concentration of dust present. Mine Safety Appliances Co., Braddock, Thomas, and Meade Sts., Pittsburgh, Pa.

Rubber-Tar Mixtures

PROMISING results have been obtained in the production of stable rubber-tar preparations, and rubber-resin materials have been investigated. Three patent applications have been made possible as a result of this work, preparation of stable mixtures containing rubber and tar or tar distillation products; improved methods of obtaining discrete particles of rubber and allied materials; improvements in synthetic plastic materials containing rubber or allied products.

Rubber Industry in America

OHIO

BUSINESS in Ohio was decidedly unsettled, largely the result of the threatened strike. Production slowed down on tires, but not on mechanicals; and the larger plants reduced their schedules to a four-day week. The outlook this spring seemed none too good, but now that the strike has been settled, conditions may improve.

Master Tire Activities

Master Tire & Rubber Corp., Akron, has opened a new department to manufacture inner tubes for automobile casings at its plant in Philadelphia, Pa., The Quaker City Rubber Division, where the manufacture of tubes is now going forward in a moderate way and will be gradually expanded until capacity production is reached, orders now in hand making peak production necessary. These new facilities according to F. C. Millhoff, vice president and general sales director, open up for Master a vast potential market in southern and west coast state points as well as in foreign trade that are reached and served effectively by the cheaper "All-Water" transportation facilities afforded out of Philadelphia. This further diversifies manufacturing in the Quaker City plant where mechanical goods are made.

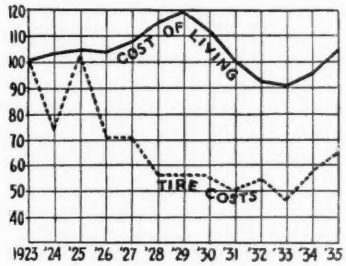
Production of inner tubes for automobile casings in other Master plants, notably Findlay, O., will continue as before, serving domestic trade, principally in states east of the Rocky Mountains.

The Cooper Corp., Findlay, another Master subsidiary, has appointed LeRoy H. Letts factory district sales representative in southern Illinois and eastern Missouri territory, with headquarters in St. Louis. Mr. Letts for several years successfully has represented tire manufacturers in this midwestern territory.

Arthur J. Keleher, for fifteen years representing tire manufacturers in various territories along the Atlantic Seaboard, recently joined Cooper as a direct factory representative in parts of New York and New Jersey, with headquarters in Newark.

Cooper also named H. Brown Fentem, for many years representing automotive lines in western states, district sales representative covering Iowa, with headquarters in Des Moines.

P. C. Sloan has been made district sales representative for Cooper, covering the territory in central and southern Indiana, with headquarters at Indianapolis.



Tire Costs Compared with Living Costs

It would cost $1.03 today to buy as much as a dollar would have bought in 1923 of commodities that enter into the cost of living. It would cost just 63¢ today to buy as much automobile tire as a dollar would have bought in 1923. The above graph shows how the cost of living and the prices of motor tires have fluctuated between 1923 and 1935, taking 1923 costs of both as 100. While tire prices are now 40% below the average of other commodities that make up the cost of living, they are on the upward trend for the first time since 1926. *General Tire & Rubber Co.*, Akron.

Tire Price War

Early in March Sears initiated a tire price cut of 9% that was followed by special sales promotions on the part of Atlas and Ward. Discounts of 40% from lists were common in many points. Some tire manufacturers extended an additional 10% discount to dealers on their first lines and split on a 50-50 basis the point below net billing which the dealers have to go to meet chain prices. This held until April 27 when the last of the special sales expired.

Anderson-Prichard Oil Corp., Oklahoma City, Okla., has appointed Homer E. Easterday as manager of the eastern division, Akron, replacing B. C. Dodd, resigned. Prior to his connection with the oil corporation Mr. Easterday for eleven years had been in Akron, being associated with the rubber industry in a production capacity and later with raw material and crude rubber brokerages and sales to both the rubber and the paint and varnish industries. Anderson-Prichard also named John Licata sales manager of the eastern division. He had been employed by the company for six years in a sales capacity in Akron territory and previously had been with the Falls Rubber Co., Cuyahoga Falls.

The Dayton Rubber Mfg. Co., Dayton, of which John A. MacMillan is president, is celebrating its thirtieth anniversary. The firm, founded in 1905, specialized in mechanical rubber goods until 1912. Then the manufacture of tires also was adopted. The latest product, recently introduced, is the Dayco printers' roller.

The Strike Situation

A last-minute meeting in Washington on April 11, suggested by President Roosevelt, with invitations coming from Secretary of Labor Frances Perkins and attended by representatives of rubber manufacturers and rubber union leaders, resulted in a compromise submitted to and accepted by the Akron rubber company employes who had threatened to strike unless labor union representatives were recognized by Goodrich, Goodyear, and Firestone in their dealings with workers and unless satisfactory wage adjustments for a maximum 30-hour week were made and unless a definite working basis for future negotiations was settled upon.

The trouble began in March when executive committees of the United Rubberworkers' Union, locals of the American Federation of Labor, presented to The Goodyear Tire & Rubber Co., The B. F. Goodrich Co., and the Firestone Tire & Rubber Co., all of Akron, employing about 35,000 workers, the demands the companies enter into negotiations to draw a written agreement recognizing the union, abolishing financial support to "company unions," and establishing a maximum 30-hour week. The rubber concerns flatly refused these demands, believing nothing could be gained for the workers by them. Then the labor leaders called for a strike vote. A three-quarters majority, followed by the sanction of the A. F. of L., is necessary to carry out a strike. Union heads also prepared to hold a separate poll for non-members of the three rubber plants to learn their sentiments.

Preparations were made by both sides to endure the walkout. Congress heard both sides of the argument while listening to testimony on the Wagner labor disputes bill. The manufacturers had been increasing inventories steadily by stepped-up production. Employes were canvassed to learn how many would remain at their posts during a walkout; food supplies and cots were moved into the plants; and barbed wire fences constructed. Company union votes conducted before the labor union ones displayed a strong anti-strike sentiment.

The police prepared with tear gas, clubs, and special deputies. Citizens' committees were organized to preserve order in the event of a strike. Ralph A. Lind, regional labor director, came to Akron to represent the National Labor Relations Board in efforts to avert a strike. His proposals to have the companies agree to a government supervised employes' election at the plants were rejected.

The union held rallies, solicited additional memberships, gathered food supplies, and organized pickets and flying squadrons such as were used in the recent textile strike. The full support of the American Federation of Labor was promised.

Goodyear workers who are union members held their secret strike vote March 31 to April 3. Goodrich and Firestone employes started voting April 7. The result was overwhelmingly in favor of the walkout.

At the same time nearly 1,500 members of the seven craft unions affiliated with the United Rubberworkers' council began balloting on the strike question. Other union groups in other industries, such as the automobile industry, offered encouragement and aid, if necessary.

Rubber company executives who conferred with Secretary Perkins on April 11 were: President James D. Tew, Vice President T. G. Graham, and Secretary S. M. Jett, all of Goodrich; President John W. Thomas and B. M. Robinson, assistant secretary and general counsel, both of Firestone; and C. C. Slusser, Goodyear vice president and factory manager. Their meeting continued two days. The following day Miss Perkins saw the union men, including William Green, A. F. of L. president, and Coleman C. Claherty, organizer of the Akron rubber unions.

The terms of the agreement signed on April 13 between company executives and labor leaders follow.

1. The management agrees to meet with employes and with the chosen representatives of any group of employes for the purpose of adjusting grievances and complaints and for the purpose of negotiating upon hours, wages, and conditions of employment for those they represent. Conferences will be held promptly upon request and grievances and complaints disposed of as expeditiously as possible.

2. The company will post on its bulletin boards in departments affected any change in hours, wages, or working conditions arrived at through negotiations with any group of its employes.

3. It is recognized that the holding of an election as ordered by the National Labor Relations Board is postponed until final decisions have been reached by the courts in the cases now pending in the Circuit Court of Appeals and the Supreme Court of the District of Columbia, and any appeals therefrom.

4. There shall be no strike or lockout or discrimination pending final decisions in the cases now pending in the Court of Appeals for the Sixth Circuit and in the Supreme Court of the District of Columbia, and any appeals therefrom. However if grievances are not settled satisfactorily, they shall be referred to a fact-finding board of three neutral members approved by the Secretary of Labor. If the recommendations of the board are not followed by either party to the dispute, then the other party may be relieved from the obligation contained in this paragraph.

The above agreement was submitted to the Akron union men on April 14. They, after much deliberation, then ratified the proposal. The strike votes, however, taken by the local unions were ordered "held in abeyance," not "cancelled."

Tire Sales Increase

Definite indication of the restraint which fear of a rubberworkers' strike placed on business in Akron is revealed in the 100% increase in new car sales last month, dealers say. For two weeks previous to the labor disputes truce reached in Washington registration of new cars averaged 30 a day, according to Harry Bennett, secretary of the Akron District Automobile Dealers' Association.

Eagle-Picher Sales Co., Cincinnati, O., has added to its Philadelphia, Pa., office Harry H. Loewenstein, who has had a long career in the white lead business, having spent fifteen years with John T. Lewis & Bro. Co. and ten years as superintendent of the Hammar Bros. White Lead Co.

The Surety Rubber Co., Carrollton, manufacturer of household and electricians' rubber gloves, which had been employing about fifty workers, recently almost tripled its personnel and had to convert the entire second floor of its plant, formerly used for shipping purposes, into space for production facilities. Besides equipment has been stepped up almost to double production, for orders have piled up for weeks in advance. Workers are on four shifts of six hours each.

Titanium Pigment Co., 111 Broadway, New York, N. Y., has appointed P. H. Cathcart representative in the Cleveland territory. Mr. Cathcart for three years held a similar post with Imperial Color Works.

National Battery Manufacturers Association will hold its spring convention in Cleveland, May 22 and 23.

The B. F. Goodrich Co., Akron, has transferred Bryant J. Brooks, formerly operating manager of the mechanical sales department, to new duties in the tire sales division, according to C. B. O'Connor, general tire sales manager. F. A. Lang has been named Mr. Brooks' successor by W. S. Richardson, merchandising manager of the mechanical division of the company.

The Firestone Tire & Rubber Co., Akron, through its subsidiary, Firestone Cotton Mills, Inc., last month purchased from the Manville-Jenckes Corp., Manville, R. I., its Loray Mills at Gastonia, N. C., including all properties, machinery, and equipment and the Loray village with over six hundred tenant houses and other structures. The plant, which made tire fabrics, has been closed since January 1.

Ray W. Brown, aeronautic tire sales manager of the General Tire & Rubber Co., Akron, and pilot of the company's Lockheed Vega plane, was elected to the Institute of Aeronautical Sciences, Rockefeller Center, New York, N. Y. Mr. Brown was also notified of his appointment by the National Aeronautic Association as chairman of the Approved Type Certificates contest committee. This committee will have the supervision of all aviation contests which are restricted to A. T. C. ships.

The Patterson Foundry & Machine Co., East Liverpool, through Sales Manager E. M. Underwood, has announced that Oliver F. Redd has joined its research department. Mr. Redd has spent several years in development engineering work, in the Bell Telephone Co.'s laboratories and the Western Electric Co. He will cooperate in research work in connection with mixing, agitating, grinding, etc., and also in the development of new or modified equipment for the process industries.

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Spreader rooms were in operation eighty years ago. The illustration shows a spreader room of The Indiarubber Waterproof Works, the Old Farm - House, Stepney, England, in 1855.

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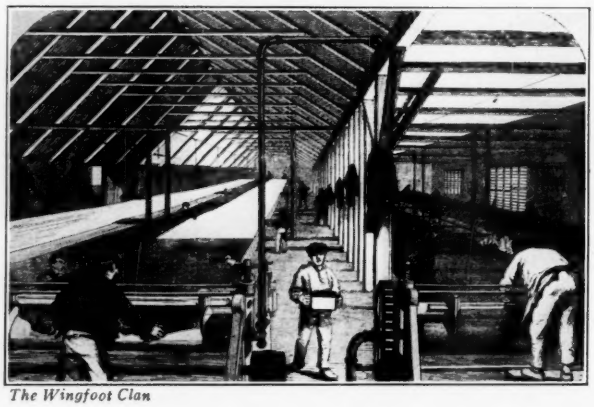

The Wingfoot Clan

EASTERN AND SOUTHERN

THE slowing down of business that prevailed during the uncertainty regarding the fate of the Work Relief Bill has been checked. Now that President Roosevelt has signed the measure it seems that business, including that of the rubber trade, will grow better.

A southern manufacturer of mechanicals, however, reports that January business was very much ahead of that of January, 1934; in February things began to slacken, and in March conditions were quite unsatisfactory. This state of affairs seems the result of an outbreak in price cutting and uncertainty as to the political and business outlook, which in turn caused sentiment to become pessimistic. It is not expected here that 1935 will show any improvement over 1934.

U. S. Rubber Activities

This year the United States Rubber Co., 1790 Broadway, New York, N. Y., will observe the twenty-fifth anniversary of the founding of its vast rubber plantations in the Far East, one of the most successful foreign enterprises ever pioneered by an American manufacturer. Starting in 1910 by planting 1,753 acres with 192,830 trees, the company has steadily expanded its holdings until today it owns and operates eleven separate plantations embracing 98,847 acres planted with 10,873,170 trees, not to mention 34,517 additional acres still to be planted. Six of the plantations are on the Malay Peninsula, and five on the east coast of Sumatra.

Crude rubber output per year at five-year intervals for these plantations tells the following story: 1915, 1,043,516 pounds; 1920, 13,112,918 pounds; 1925, 19,670,033 pounds; 1930, 36,619,876 pounds; 1934, 50,985,962 pounds. Incidentally, last year's production was more than three times as much as the combined output of all other American rubber companies. The total from 1910 through 1934 reached 470,237,463 pounds.

As early as 1914 a nucleus of a research department was started, and two years later it had become an accredited scientific organization. Until this time field experiments with rubber trees had been conducted with a hit-or-miss type of accuracy. Mathematical and statistical methods of laying out and interpreting field experiments, although fairly well developed for annual agricultural crops in Europe and America, had not been applied to rubber tree experimentation.

Since 1916, then, U. S. Rubber has been actively engaged in developing superior types of crude rubber especially adapted for its needs. One of its most important developments is sprayed rubber, possessed of qualities in manufacture that are not present in ordinary market grades.

Another development of epic importance came from the company's pioneering work with latex. In 1922 the company made the first bulk shipment of latex in a steamer tank, and today it imports from 400,000 to 500,000 gallons monthly. The future possibilities of manufacturing direct from the liquid latex are unbounded. Already many successful uses have been discovered, one of the most important being the safety bonding of tire cords. Between 100,000 and 130,000 gallons of latex are used each month in the company's tire plant at Detroit.

To carry out the theme of controlled quality in tire manufacturing the company owns and operates, besides its plantations, its own chemical plants, cotton mills, and tire building factories.

The parent organization at its annual meeting April 16 elected Samuel E. Howard and William M. Stevens directors to succeed Carle C. Conway, resigned, and to fill another vacancy. William de Krafft, chairman of the finance committee, announced that the company's business in January and February, 1935, was better than that of the same period last year, but that the subsequent tire price unsettlement had made the outlook unfavorable.

United Carbon Co., Charleston, W. Va., has formed a new subsidiary, United Carbon, Inc., to take over the company's carbon black plants in Louisiana, Texas, Oklahoma, Utah, and Montana, according to Oscar Nelson, president of the parent company. The plants heretofore had been managed by the Kosmos Carbon Co. and the Eastern Carbon Black Co. in Texas and the Texas Carbon Industries in Texas and Oklahoma.

Tappers on U. S. Rubber Plantations, Inc.

Revertex Corp. of America, distributer of highly concentrated (about 75%) rubber latex, on May 1 transferred its offices from 40 Rector St. to 80 Broad St., New York, N. Y. Telephone: Bowling Green 9-5523.

Society of Automotive Engineers will hold its summer meeting at White Sulphur Springs, Va., June 16 to 20.

Charles E. Wood, Inc., crude rubber importer, moved April 6 to 140 Cedar St., New York, N. Y., through Presitor 2-6755, 6756, and 6757.

The New Jersey Zinc Co., 160 Front St., New York, N. Y., through President James E. Hayes has announced that at a meeting of the directorate on March 27, Newman W. Adsit was elected treasurer to succeed the late Henry S. Wardner.

The Toy Fair

The annual American Toy Fair, under the auspices of the Toy Manufacturers of the U. S. A., Inc., 200 Fifth Ave., New York, N. Y., was held April 1 to 20 at the Hotel McAlpin and the Fifth Ave. Bldg., 200 Fifth Ave., both in New York. Many interesting exhibits featured playthings wholly or partly of rubber. Among these were:

American Character Doll, Inc., Fifth Ave. Bldg., displayed rubber dolls and novelties. In attendance were J. Brock, George D. Schwartz, Nathan Redlich, Jr., George Hoffman, and Jas. Vysco.

The Barr Rubber Products Co., Sandusky, O., under the direction of Wm. J. Canary, featured balloons, sponge and gas inflated balls, and molded rubber novelties.

Collette Mfg. Co., Amsterdam, N. Y., under the guidance of Albert F. Heck, displayed juvenile sporting goods.

P. Goldsmith Sons Co., Cincinnati, O., exhibited junior sports equipment. Paul A. Francisco was in charge.

Ideal Novelty & Toy Co., 273 Van Sinderen Ave., Brooklyn, N. Y., showed all-rubber dolls and dolls with rubber limbs. Company representatives included I. H. Bernhard, Irving Cohen, and B. F. Michtom.

McKinnon Leather Products, Inc., 252 Amherst St., Buffalo, N. Y., with Fred W. Roth in attendance, had footballs, basketballs, baseballs, soccer and volley balls, etc., on view.

Miller Rubber Co., Inc., Akron, O., under the direction of Paul S. Keeler, presented rubber balls, toys, and dolls, including the "Popeye" line.

Pennsylvania Rubber Co. of America, Inc., Jeannette, Pa., represented by Tom B. Roberts, showed play balls, inflated toys, and novelties.

Rubber Specialties Co., Inc., Conshohocken, Pa., featured Bild-O-Brik, the toy rubber brick construction set; Ruspco, the acrobatic spelling clown set, and the Big Top Rubber Circus set including dogs, cats, horses, elephants, ducks, and clowns. Company execu-

tives present were E. E. Tompkins and N. F. Gillam.

Schavoir Rubber Co., Springdale, Conn., exhibited rubber dolls, toys, balls, and playthings for dogs. Greeting the visitors were A. L. Schavoir and E. S. Roe.

Seiberling Latex Products Co., Akron, O., under the guidance of C. W. Simpson, showed rubber models of the "Walt Disney" characters, as Mickey Mouse and his pup, Pluto, the Three Little Pigs, and The Big Bad Wolf; inflated and sponge balls; dolls; miniature automobiles; sling shots; and combination packages and gift sets.

Sun Rubber Co., Barberton, O., with T. W. Smith, Jr., in attendance, had on display its three new animals standing erect: a cat, a dog, and a bear; other animals; tiny cars; dolls and bedtime, bath, and Cozy Cottage sets for them; teething rings, etc.

The Superior Type Co., 3940 Ravenswood Ave., Chicago, Ill., had its display of rubber stamp printing sets under the supervision of George R. Smith.

C. B. Webb Co., 200 Fifth Ave., New York, headed by C. B. and C. A. Webb, showed Weaver health, valve, and scholastic balls.

The Oak Rubber Co., Ravenna, O., at its display at 10 Frelinghuysen Ave., Newark, N. J., in the charge of Walter J. Leatherow, had toy balloons.

American Cyanamid Co. and **American Cyanamid & Chemical Corp.** recently announced that, in line with the new general practice in the chemical industry, the New York, N. Y., offices at 30 Rockefeller Plaza, will be operated on Saturdays with a skeleton force only, to handle emergency orders. This plan will become operative on June 1 and extend to September 28 inclusive.

Engineering Index, Inc., 25 W. 43rd St., New York, N. Y., formerly an activity of the American Society of Mechanical Engineers, was recently incorporated as a non-profit membership corporation. Frank Y. Stewart, for twenty-five years in the rubber business in New York and business manager of the Engineering Index since 1929, has been named its executive vice president.

Mercer Rubber Co. of New York, Inc., 19 Coenties Slip, **Boston Belting & Rubber Corp.,** 25 Warren St., and **J. W. Buckley Rubber Co.,** 69 Warren St., all of New York, N. Y., all of which for years have acted as distributers for Mercer Rubber Co., Hamilton Square, N. J., manufacturer of mechanicals since 1866, recently merged and will maintain offices and warehouse at 28 Warren St., New York, where a complete stock of high-grade mechanical rubber goods will be carried. The officers under which these combined companies will operate are: president, Karl W. P. Reece; vice president and treasurer, William A. Dale; secretary, John W. Buckley; general manager, Irving B. Moore; directors, the aforementioned officers and W. H. Sayen, Jr., president of the Mercer company in New Jersey.

FINANCIAL

Company Reports

Denman Tire and Rubber Co., Warren, O. For 1934: net loss after expenses and other charges, $100,281, compared with $8,153 loss in 1933.

Garlock Packing Co., Palmyra, N. Y., and subsidiaries. For 1934: net income after depreciation, interest, amortization, federal taxes, and other charges, $562,175, equal to $2.85 a share on 196,930 no-par capital shares, excluding 4,715 shares in treasury, compared with $374,107, or $1.89 a share on 197,286 shares in 1933.

Rubber Code News

Official NRA Orders

Code No. 156: Order 69, modifying Administrative Order No. 156-37 conditionally approving Uniform Accounting Manual by extending from December 24, 1934, to and including March 25, 1935, the time within which the Code Authority is required to report the results of the use of the manual to the Division Administrator.

Order 70, denying to M. Rudolph & Co., DeKalb, Ill., exemption from the provisions of Chapter X, Article III-B, Section 2, of the Code.

Order 71, granting to Phillips-Baker Rubber Co., LaCrosse Rubber Mills Co., and Goodyear Rubber Co. a stay of the provisions of Chapter IV, Article V-A, of the Code, until further order of NIRB.

Earle Bros., specialists in balata and gutta percha, announce the removal of their office to 24 State St., New York, N. Y.

Archer Rubber Products Co., Inc., manufacturer of Marble-ized tiling, flooring, matting, mechanicals, etc., on May 1 moved from Grand Central Terminal to 52 Vanderbilt Ave., New York, N. Y.

Columbian Carbon Co., 41 E. 42nd St., New York, N. Y., at its annual meeting elected to the board of directors William L. Heim, whose father was one of the founders and first directors of the company.

William Hohwieler, owner of The Hohwieler Rubber Co., engineer and manufacturer of molded rubber products, W. Bridge St., Morrisville, Pa., recently was reelected a director of the local chamber of commerce for another term of three years.

I. B. Kleinert Rubber Co., 485 Fifth Ave., New York, N. Y., and domestic subsidiaries. For 1934: net income after including $224,119 life insurance proceeds was $263,128 after depreciation, expenses, provision for federal income taxes, and other charges. This compares with net income of $46,085 in 1933 before foreign exchange adjustment.

Thermoid Co., Trenton, N. J., and wholly owned subsidiaries, excluding Southern Asbestos Co. For 1934: net loss after taxes, depreciation, federal taxes, and other charges, $113,892, contrasted with net income of $115,718, equal to $3.66 a share on 31,578, $100 par, 7% preferred shares, in 1933.

Rubber Failures—1934

Continuing the down trend which in 1933 reduced the number of failures by exactly half that set down for 1932, in 1934 the total for manufacturers, wholesalers, and retailers of rubber goods was reduced to 7 from 13 a year earlier, or a drop of 46.2%. From the all-time peak, which was reached in 1932 at 26, bankruptcies in 1934 were reduced by 73.1%.

While the defaulted indebtedness of the firms that went bankrupt was not curtailed so largely as in 1933, when there was a drop of 85.5% from the 1932 figures, the total of $88,361 in 1934 represented a decline of 57.7% from the $208,856 for 1933. When compared with the peak loss which the industry has been forced to sustain because of failures, which occurred in 1931 at $2,164,270, the loss in 1934 was smaller by 95.9%.

MANUFACTURERS

Year	Number	Liabilities
1927	4	$1,576,900
1928	6	238,200
1929	4	268,000
1930	4	67,200
1931	8	1,952,170
1932	14	923,883
1933	7	139,968
1934	5	62,551
1935*	1	5,000

WHOLESALERS AND RETAILERS

Year	Number	Liabilities
1927	11	$133,400
1928	9	95,000
1929	2	4,600
1930	4	50,200
1931	7	212,100
1932	12	514,800
1933	6	68,888
1934	2	23,810
1935*	..	.....

*January and February, inclusive.

Data from Dun & Bradstreet, Inc., 290 Broadway, New York, N. Y.

Dividends Declared

Company	Stock	Rate	Payable	Stock of Record
Collyer Insulated Wire Co.	Com.	$0.10	Apr. 1	Mar. 27
Dunlop Rubber Co., Ltd.	Ord. Reg.	8%	.....	.....
Dunlop Rubber Co., Ltd.	(Am. Dep. Rec.) for Ord. Reg.	8%	.....	.....
Goodyear Tire & Rubber Co. of California	7% Pfd., Accum.	$0.50	May 1	Apr. 25
Goodyear Tire & Rubber Co. of California	7% Pfd., Accum.	$0.50	July 1	June 21
Norwalk Tire & Rubber Co.	Pfd.	$0.87½ q.	July 1	June 21
Pirelli Co. of Italy	Am. Shares, A	$3.84	May 1	Apr. 24
Rex Hide Rubber Mfg. Co.	Com.	$0.25	Apr. 15	.....

MIDWEST

RECENT business in all lines in the Chicago territory was large, though more spotted than usual, last month. Among products handled in quantities were textiles, tires, and rubber goods. Mail order houses reported the heaviest business in years.

At the height of a more than seasonal rise the automotive industry continues to bubble with enthusiasm. Sales reports from all parts of the country have been so favorable that the cup of good cheer in Detroit is running over. And the trend of retail deliveries of new cars indicates that the cup is likely to be brimful for at least several more months. Data from the *Iron Age*, April 25, 1935.

Final returns from the Automobile Labor Board's first election program in sixty-three automotive plants in Michigan and the rest of the nation were announced April 24, showing that 68.6% of the 163,150 voting workers had cast unaffiliated ballots. Various employes associations polled 21,774, or 13.3%. The American Federation of Labor stood in third place with 14,057, or 8.6%; while the Associated Automobile Workers of America came next with 6,083, or 3.7%.

American Society of Mechanical Engineers has scheduled its national oil and gas power meeting for Tulsa, Okla., May 8 to 11.

Carbide & Carbon Chemicals Corp., 205 E. 42nd St., New York, N. Y., during March placed in operation its new plant at Whiting, Ind.

American Society for Testing Materials will meet in Detroit, Mich., June 24 to 28.

National Association of Waste Material Dealers held its twenty-second annual convention at the Hotel Sherman, Chicago, Ill., March 18 to 20, at which the following officers were elected: president, E. B. Friedlander; first vice president, Joseph Schapiro; second vice president, J. V. Spachner; third vice president, Harry S. Goldstein; treasurer, reelected, Charles M. Haskins; directors: Samuel Appel, George Birkenstein, I. Cohen, David Feinburg, Egmont Frankel, H. B. Grevnin, Albert T. Hicks, N. R. Johaneson, Milton Levenson, E. E. Oury, Mr. Schapiro, Mr. Spachner, William Steck, Jacob Stovroff, H. R. Woodward, and Louis G. Galamba. The officers and executive committee given on page 58 of our April issue were for the Scrap Rubber Institute; they were not the elected executives of the National Association of Waste Material Dealers.

The Monsanto Chemical Co., St. Louis, Mo., recently acquired the Atlantic Chemical Co., Billerica, Mass., manufacturer of heavy chemicals, which will be consolidated with the Merrimac Chemical Co., Boston, a Monsanto subsidiary.

(*Continued on page* 80)

NEW ENGLAND

The Stamford Rubber Supply Co., manufacturer of rubber factice, Stamford, Conn., according to Sales Manager R. H. B. Fuller, is celebrating its thirty-fifth anniversary this year. W. F. Gillespie is general manager of the concern.

The Phillips-Baker Co., Providence, R. I., was awarded a contract valued at $50,178.25 for rubber footwear for the United States Army, according to Major George Luberoff, commander of the Boston Quartermaster Depot. The award was part of a group of contracts for footwear amounting to $858,077 given to Eastern manufacturers, the awards going to the lowest bidders. These contracts included 390,625 pairs of overshoes, 19,532 pairs of hip boots, and 19,532 pairs of heavy knee rubber boots.

Cambridge Rubber Co., footwear manufacturer, Cambridge, Mass., this spring is offering over forty different types of shoes, including sandals and shoes for sport and street wear. In accordance with its established policy the firm is marketing new numbers this season: the "Buckide Oxford," with detachable peasant tongue; and the "Swiss Tie," inspired by Tyrolean styles. Already both models are enjoying good sales. The company also is working on new ideas in fur trimmed styles of rubber footwear, of which this firm is the originator and promoter. At present the factory is running to capacity manufacturing novelty merchandise, approximately over 15,000 pairs daily; but nothing is being done now on standard goods. The interior of the Cambridge Rubber plant has been refinished so that it is spotless. The labor that handles the footwear, moreover, must at all times have clean hands.

Globe Rubber Works, Inc., 45 High St., Boston, Mass., at its recent spring sales conference featured the initial showing in the East of the largest display of mechanical rubber goods ever seen in New England. This exhibit, which occupied nearly half a floor, was prepared by engineers of the Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc., Passaic, N. J., for its Boston distributers. Talks and demonstrations on the hundreds of items in the exhibit, many of them new to the trade, were given by William White, director of the laboratory research department, and James J. De Mario, advertising manager of the Manhattan Division. The spring conference, attended by close to fifty persons, including salesmen and dealers, was under the direction of Arthur I. Knowles, general mahager, and C. J. Leonard, sales manager, both of the Globe Rubber Works, Inc. W. S. Knowles, president of the company, outlined plans for an aggressive sales and promotional policy for the coming year.

W. L. Montgomery & Co., Inc., a commission house established in 1878, 89 Beach St., Boston, Mass., will represent J. T. Johnstone & Co., Inc., 15 William St., New York, N. Y., in the sale of crude rubber in New England.

Franklin St. Garage, Bristol, R. I., with a bid of $367.14, has won the contract by the Bristol Board of Fire Engineers to furnish eight tires for two of the department's fire trucks. In view of the fact that the United States Rubber Co. renders the town free fire alarm service, the board voted to award the contract to the Franklin St. concern, the only dealer handling the U. S. company's tire product, despite the fact that the bid was not the lowest submitted.

The Special Libraries Association will hold its twenty-seventh annual convention at Hotel Statler in Boston, Mass., June 11 to 14. Within the Science-Technology Group of the association a committee on rubber has been organized, with Edith L. Shearer, consulting librarian of the Western Union Telegraph Co., Inc., New York, N. Y., as chairman. Among the members are Margaret G. Smith, librarian, United States Rubber Co. general laboratory, Passaic, N. J.; Hilda P. Albaugh, librarian, Firestone Tire & Rubber Co., Akron, O.; Lucille A. Carter, technical librarian, B. F. Goodrich Co., Akron; and Edith J. Morris, Goodyear Tire & Rubber Co., Akron.

Rhode Island Rubber Club held a meeting April 11 in the auditorium of the National India Rubber Co., Bristol, R. I. This meeting was in the form of a smoker and buffet supper, followed by a short social period enlivened by four boxing matches of about three rounds each. The winner was presented with a wristwatch, and the opponent received a billfold. Following the boxing events a door prize was drawn, which turned out to be a live goat, an outcome that elicited much interest and amusement. The balance of the evening was enlivened by several acts of vaudeville. The annual meeting is being planned tentatively for a date in June not yet determined. At that time the election of officers will be held.

S. C. Stillwagon, formerly with the United States Rubber Co., is now associated with Naugatuck Chemical, Naugatuck, Conn.

The Armstrong Rubber Co., West Haven, Conn., has been charged by the Federal Trade Commission with advertising its product at "factory prices," although quoting secret lower prices to distributers. The complaint charged the company with "unfair competition in the advertising and printing of automobile tires and tubes." A hearing was set for May 24 when the company will attempt to show cause why an order to cease and desist should not be issued against it.

NEW JERSEY

RUBBER manufacturers of New Jersey report a general increase in all lines of business. The spurt in automobile production in western plants and the calling off of the proposed rubber strike in Akron had a good effect upon some of the New Jersey plants. The hard rubber situation is also holding its own, with shoe and heel production remaining good.

Jos. Stokes Rubber Co., Trenton, is erecting a new shipping department and small office building at its plant in Welland, Ont., Canada. The old office and shipping rooms will be used for manufacturing purposes. The company reports improvement both at the Trenton and Welland factories.

Acme Rubber Co., Trenton, business is 40% better than at this time last year. John A. Lambert, Acme vice president and treasurer, was on a business trip to Akron, O.

The Lambertville Rubber Co., Lambertville, will reopen its plant shortly to fill the demand for its products and will operate steadily throughout the summer. A few weeks ago the company had ordered a shutdown until the latter part of May.

Murray Rubber Co., Trenton, now operates with two shifts and reports increased orders for tires and tubes.

Zee Zee Rubber Co., Yardville, which filed a petition in bankruptcy August 6, 1921, has had its affairs brought to a close by Harry Klag, trustee in bankruptcy. All wage claimants were paid in full; while the general creditors received little. Nothing was paid stockholders and bondholders. The concern was organized by Irving and William Zimmerman. After it failed, the plant was sold to the Spartan Rubber Co., for $58,000. The latter concern also failed, and the plant is now owned by the Thiokol Corp.

Essex Rubber Co., Trenton, is running normally. Lawrence M. Oakley, company executive, was on a business trip to Boston.

Whitehead Bros. Rubber Co., Trenton, is running full time in all departments, with all the older hands back to work. President Frederick B. Williamson, Jr., was recently awarded damages of $10,000 in Mercer Court for injuries received two years ago in an automobile collision near Trenton.

Titanium Pigment Co., 111 Broadway, New York, N. Y., is rushing completion of its new plant at Sayreville, N. J., and it is expected that fires will be started any day. The plant will cost $4,300,000 and will augment the company's production of titanium oxide and titanium dioxide at St. Louis and Niagara Falls. The Sayreville unit will be the largest of its kind in the country, and although manufacturing operations will be principally mechanical, it is understood that approximately 200 persons will be required to man the plant.

Thermoid Notes

The Thermoid Co., Trenton, moved seventy-five executives and general office employes to the new quarters in a building purchased from the Roller Bearing Co. of America, situated directly opposite the Thermoid plant. Several departments will remain in the old building; while the automotive, mechanical, export, order, and billing departments occupy new quarters. The company has established a modern cafeteria for employes. A portion of the new factory will be used by the Thermoid Textile Co. The Woven Steel Hose & Rubber Co., another Thermoid subsidiary, will be moved soon opposite the Thermoid plant.

Four suits have been filed in the New Jersey Supreme Court against the Thermoid Co., in which holders of a part of a $2,500,000 issue of notes seek to enforce a gold clause in the provisions for repayment. The claimants, each of whom holds $3,000 worth of the notes, an issue of February 1, 1929, are: Peter Van Wyk, Anna Novak, Betty Semenecz, and Edna Engasser, all of North Jersey. The suits cite a clause in the notes which states that the principal and interest will be paid "in gold coin of the United States of America of or equal to the standard of weight and fineness existing on February 1, 1929."

Thermoid has announced that business was better in March than during any other month of the past few years. The company is very busy, operating with three shifts in all departments.

The firm has appointed as advertising manager E. V. Carlquist, who formerly held a similar position with the Armstrong Cork Co.

N. Y. Belting Changes

B. F. Ruether, general manager of the New York Belting & Packing Co., Passaic, recently announced the following changes in the personnel of the company's sales organization.

Harry H. Raber was appointed Mr. Ruether's assistant with headquarters at the company's main office and factory, Passaic. For the past fifteen years Mr. Raber did clerical work under the direction of the general manager.

J. W. Webster, with the company since December 15, 1926, was transferred from the middle Atlantic States to the territory comprised of Tennessee, Alabama, Florida, and Georgia.

Donald F. Potter has been added to the sales force to take over part of Mr. Webster's territory in Delaware, Maryland, Virginia, North Carolina, and southern Pennsylvania. Mr. Potter has been identified with the sale of mechanical rubber goods for the past eighteen years.

John V. Lanahan, assistant to the sales manager of a large midwest distributer of industrial supplies for the last ten and one-half years, has joined the New York Belting & Packing sales organization and will cover Michigan, Indiana, Illinois, Iowa, southern Ohio, southern Wisconsin, and eastern Missouri.

O. L. Wall, for several years chief clerk at the San Francisco warehouse, was assigned to sales work on the Pacific Coast.

Charles E. Stokes, Jr., vice president of the Home Rubber Co., was elected a director of the Mercer Hospital Association, both of Trenton.

Luzerne Rubber Co., Trenton, finds hard rubber production improved.

The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc., manufacturer of mechanical rubber goods, Passaic, N. J., has changed its Pittsburgh, Pa., address to 2117 Koppers Bldg., Seventh Ave. and Grant St.

Nearpara Rubber Co., manufacturer of reclaimed rubber, Trenton, suffered heavy loss April 24, when a fire started in a drying machine and spread rapidly, causing the night shift to flee from the building. President Nathan Rosenthal declared all machinery was badly damaged. Firemen fought the blaze more than two hours. The Pocono Co., a short distance away, placed its water tank at the disposal of the firemen.

OBITUARY

Rubber Manufacturer

WILLIAM A. VAIL, president of the Vail Rubber Works, St. Joseph, Mich., died suddenly April 11 at his home in St. Joseph. Mr. Vail was 75 years old and had been actively engaged in the rubber roll covering business for forty years. Surviving are two daughters and six grandchildren.

Company Foreman

THOMAS J. WALL, 65, of Trenton, N. J., was fatally stricken with a heart attack while motoring with his wife near Hightstown, N. J., March 23. Mr. Wall was a foreman for the Acme Rubber Mfg. Co., Trenton, for nearly twenty years. He was a member of the Loyal Order of Moose. Surviving are his wife and a son. Burial was at Lambertville, N. J.

Veteran Employe

JAMES A. McGOWAN, of Lawrenceville, N. J., a retired employe of the United States Rubber Co., died recently after a lingering illness. He formerly lived in New Brunswick, where he had been employed by the rubber concern. He was a member of the Holy Name Society, Ancient Order of Hibernians, and the Exempt Firemen of Trenton. Interment was at New Brunswick.

Rubber Industry in Europe

GREAT BRITAIN

Latex Impregnating Textiles

So far the use of latex by manufacturers of textiles has been very limited, and relatively little work appears to have been done in this field, H. P. and W. H. Stevens pointed out in a paper on coating and impregnating fabrics and textiles, read before a meeting of the London and District Section of the Institution of the Rubber Industry on February 27, 1935. Since latex does not penetrate the walls of fibers, but merely enters the spaces between threads of a cord if not twisted too tightly, its use in textile factories would be restricted to that of a mechanical coating, binding, or finish. The authors undertook a number of tests to determine the effect of treating or "padding" a fabric with a latex composition. In these experiments the length of cloth was led through a latex bath, where it was found that bleached cloth took up the latex readily, but unbleached cloth usually required a suitable wetting agent. A single bath or "padding" gave the cloth a "fuller" feel, but did not otherwise affect its appearance and other properties. After the cloth was alternately padded and dried two or three times, the rubber became visible, and the cloth had a tacky feel, the tackiness increasing with each succeeding padding.

The tackiness seems due to increasing accumulation of non-rubber constituents. Various methods are described for overcoming this defect wholly or partly: leaching out the serum substances with warm water, combining with starches and waxes; surface treatment with dilute chlorine water. The first method is a lengthy process unsuitable for most goods. Smooth, glossy, and generally attractive surfaces, satisfactory in every way, are obtained when a relatively low proportion of latex is used in combination with starches. With higher proportions of rubber tackiness continues noticeable. The use of vulcanizable latex offered the advantage that washing with soap removed tackiness. Incidentally various tests on the resistance of the finish to washing indicated that rubber did not very materially improve the retention of soluble carbohydrates by the cloth.

Smooth finishes free from tackiness were obtained when a bath containing latex, and twice or more the amount of wax was used. The incorporation of vulcanizable latex with wax emulsion for finishing showerproof cloth gave greatly improved fastness to benzene.

Experiments with spread mixes led to the conclusion that the machines and appliances used in the textile industry can be readily adapted to spreading compounded latex. The latex mixtures used for spreading generally require thickening by flocculation or the addition of caseinates, starches, dextrines, etc. Ammonium caseinate was found especially suitable because of its stabilizing effect on latex. When 10% (calculated on the rubber) of this thickener was used, very considerable loading with white pigments was possible. Colored pigments may also be used, but care must be taken to avoid those containing rubber oxidation catalysts. Mixtures of latex and thickener, without filler, can also be used. Soluble starch appears most useful here, as it shows no tackiness, and mixtures compounded with it are suitable for spreading on one or both sides of cloth for use as book cloths, waterproof aprons, light excluding cloth for photographic work, window shades, etc.

I. R. I. Papers

At another meeting of the above section of the Institution of the Rubber Industry, March 11, several short papers were read. J. R. Scott, of the Research Association of British Rubber Manufacturers, spoke on the rationalization of the hardness testing of rubber. He considered the best form of instrument for a standard was one using a dead weight and a blunt form of indentor, such as a ball. Tests with vulcanized rubber samples, from softest pure mixes to the very hard shoe-soling type of rubber, showed an approximate proportionality between the elastic modulus of the rubber at small deformation and the force required to produce an indentation of a given depth with a ball of a given size. Thus the indentor hardness test promises to yield a rapid and convenient method of obtaining an approximate measure of the elastic modulus of vulcanized rubber. It was further found that the depth of indentation of a given rubber depended on the diameter of the ball and the amount of force applied; the depth of indentation was very nearly inversely proportional to the square root of the diameter of the ball. Consequently readings of any hardness testing instrument using a ball indentor under a known load can be converted into corresponding readings on any other instrument with a different size of ball or different load or both.

F. H. Cotton next explained the working of his apparatus for determining the color of latex, in which is used a box with the inside blackened, while a block of ordinary domestic salt is the standard of whiteness.

Finally Mr. Cotton and P. A. Gibbons presented a paper on the properties of semi-ebonite. This material, which resembles ebonite in appearance, combines the flexibility of soft rubber with the toughness of ebonite. It is prepared by curing mixes with 17½ to 25 parts of sulphur per 100 parts of rubber for 4 to 5 hours at a steam pressure of 50 pounds. Test heels and soles made from this material showed good wearing qualities, though they lacked grip because of the smoothness of the surface. Aging is reasonably good, but poorer than that of accepted leather substitutes of rubber and filler compounds.

British Notes

The several stores for retailing Bata products in England, established experimentally, must have proved extremely successful for Bata Shoes (British), Ltd., is to open fifty new stores within the next six months and is planning to bring the number up to 200. The first store of the new chain was opened recently at Gravesend. It is further announced that the capital of the company has been increased from £20,000 to £100,000.

A simple and apparently effective innovation introduced for the protection of coal miners consists of so-called safety trousers with special pockets over the knees into which large oblong-shaped rubber sponges are slipped.

Various advantages are claimed for the new Rublock reclaiming process, the right to use which has been given Typke & King, Ltd. Any kind of scrap with or without fiber can be utilized; little or no extra plant is required beyond what is usually employed in rubber factories; a plastic product is obtained with no increase of gravity and no waste; the cost of working up into finished vulcanized goods is low.

Flexible Lamps, Ltd., London, has added a new rubber side lamp to its line of unbreakable lamps for vehicles. The lamp, put out in various sizes, is of molded rubber with fitted chromium-plated reflector. It can be mounted on the wing or a side bracket and is claimed to be unbreakable and vibrationless.

James Ferguson & Sons, Ltd., manufacturer of hard rubber dust, Princes Rd., Merton Abbey, London, S.W. 19,

announces its new registered telegraphic address as "Nestorius, Wimble, London." Hermann Weber, 67 Broad St., New York, N. Y., is American distributer for Ferguson.

R. O. Bishop, former head of the chemical and technological divisions of the Rubber Research Institute, Malaya, has left for the Far East where he will undertake private advisory and consulting work on latex and rubber production. Henry P. Stevens & Son, 15 Borough High St., London, S.E.1, will cooperate with him in this work whereby a joint consulting technical service will be available, in effect from the tree to the consumer.

The foundation stone of the new Rubber Exchange was laid with appropriate ceremonies on March 27. The new building, when completed, will be the second largest in the City of London with an area of over 41,000 square feet. It will contain not only the Rubber Exchange, but tea salesrooms and other offices equipped with all modern devices. It will be the center of all the trades of Mincing Lane.

Under an agreement, applying only to the sale of industrial electro-chemical instruments and certain types of flowmeters, between Leeds & Northrup Co., Philadelphia, Pa., and George Kent, Ltd., of Great Britain, Kent will not offer its industrial electro-chemical instruments or its flowmeters for sale in the U. S. or Canada unless through Leeds; while Leeds will not offer its similar instruments for sale in the British Empire (except Canada) unless through Kent.

Germany

Manufacturers and dealers in the Saar Territory handling rubber, gutta percha, balata, waste, old and reclaimed rubber, asbestos, and carbon black are now subject to the same rules and regulations as those in the rest of Germany. Recently they were required to register and to fill in forms stating their stocks, obligations, sales, purchases, etc.

According to the latest ruling of the Rubber Control Bureau, manufacturers may not use crude, waste, old, or reclaimed rubber in the production of goods intended for home consumption, without a special permit. The products include tires of all kinds, mechanical and surgical goods, heels, soles, and footwear, apparel, bathing accessories, rubberized raincoat fabrics, technical fabrics, hard rubber goods, dipped goods and solutions, cut sheet and articles made of it, sponges and sponge rubber goods, foam rubber, thread, toy and sport balls, tennis rings, rubber dolls, and conveyer and transmission belts.

The eighth general meeting of the Deutsche Kautschuk Gesellschaft (Scientific Association of Rubber Chemists and Engineers) is to take place in Dresden May 30 and 31 and June 1, 1935. This meeting is to be international in character, and certain well-known foreign rubber chemists and technologists are to read papers on various branches of rubber science and technology. Besides the interchange of knowledge, the aim of the meeting is frankly stated to be to correct any unfavorable impressions of the German people the visitors may harbor so that they will leave convinced that Germans are an industrious, peaceable, and cultured people with whom it is no shame to collaborate.

New trends in the tire and automobile parts industries were evidenced at the International Automobile Exhibition held recently in Berlin. Revised traffic regulations have led to an increased use of resilient solid tires again for special purposes. Considerable interest is now being shown in retreading tires and grooving worn treads. Various apparatus worked wholly or partly by hand, or automatic, intended for grooving lateral or longitudinal channels, were shown. In the Christoforus process of Oelssner very fine grooves are cut 5 to 10 mm. apart and parallel to the circumference by means of thin blades. These grooves are only effective when the car skids; then the grooves spread and offer the resistance necessary to prevent slipping.

At the exhibition it was noted that Germany has at last realized the importance of rubber parts for automobiles. Continental of Hannover, Getefo of Berlin, and the Ferroflex Gesellschaft of Harburg, recently established by Mecano and Phoenix, have done much in this direction especially in the way of developing rubber to metal bearings. Ferroflex, it may be mentioned, produces perfectly bonded rubber to light metal (aluminum products) parts which are valuable in airplane construction.

European Notes

Following the successful bulk shipment of liquid latex to Liverpool in April, 1934, the Dunlop Rubber Co. shipped 53,000 gallons of latex to Havre, France, for its French works, arriving on February 16, 1935. To handle the latex at Havre two storage tanks holding 125 tons each had been erected on one of the docks; besides 20 small tanks of 8 tons capacity each had been constructed to transport the latex by barge or railroad, and an electric pump and flexible pipelines provided for transferring latex between containers.

A section for rubber footwear has been formed in the Polish Apparel Makers' Association, which all Polish manufacturers of rubber footwear have joined except the local Bata concern. At a recent conference in Warsaw basic prices for certain lines were discussed, and a 10% increase in the price of sports shoes and a decrease of 5 to 10% on certain other lines were decided upon. Since representatives of rubber manufacturers have not yet signed an agreement, it remains to be seen whether the conference will yield results or prove to be merely another empty gesture.

The Swiss firm of elastic goods manufacturers, Walter Kundt, vorm. H. Stadelmann, Elgg, has established a branch factory in Hochst, Vorarlburg, Austria. The firm specializes in elastic stockings for varicose veins, the latest types including the two-way stretch "Lastoflex" stockings of latex thread combined with cotton, wool, or silk, which are very light in weight. Other articles include elastic girdles of various types and elastic yard goods for the corset industry.

A. S. Norske Gummiprodukter is a new rubber goods factory established recently at Stavanger, Norway, with a capital of 550,000 kroner.

The chief rubber manufactures now made in Esthonia are footwear, hose, belting, and rolls. The young industry is progressing favorably, and in 1934, 152,500 pairs of rubber shoes were produced. The imports of rubber footwear appear to have been falling and in 1934 came to 128,700 pairs; on the other hand imports of tires for automobiles and cycles rose from 117 tons in 1933 to 194 tons in 1934, which was a record figure.

Official data reveals that 11,200 tons of synthetic rubber were produced in Soviet Russia in 1934 against 2,189 tons in 1933. The program for 1935 calls for an output of 5,000 tons in the first quarter.

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(*Continued from page* 51)

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Age-Rite Syrup

Age-Rite Syrup, newest of the Age-Rite group of antioxidants, is a ketone-amine reaction product in syrupy form. Its specific gravity is 1.03, weight 8.6 pounds per gallon. This general purpose antioxidant for use in rubber is uniform, stable, and does not bloom when used up to 3% on the rubber. It is useful for practically any stock except white or colored and imparts good protection against flex cracking and aging. It activates cure less than Age-Rite Resin, but slightly more than Age-Rite Powder, Age-Rite Gel, or Age-Rite HP. Usually no adjustment of accelerator will be required.

Syrupy antioxidants do not have the strong blooming tendency so characteristic of antioxidants in powder form; therefore the former can be used in higher proportions without fear of blooming. They can be weighed off easily and poured directly in the rubber, or they can be master-batched. They are readily incorporated in the rubber, and there is no question of the completeness of their dispersion.

Rubber Industry in Far East

NETHERLAND INDIA

Native Industry in Java

Compared with the native rubber industry in the Outer Provinces, the native industry in Java is insignificant and rarely mentioned. It is interesting to note, however, that as a result of registration for restriction, it has come to light that under 20,000 small owners possess 3,250,000 tappable trees. The rubber produced by the native in Java has always been shipped as estates rubber. For restriction purposes Java small holders are grouped in the second class; the first class comprises European estates, and the third, native holdings in the Outer Provinces. Individual restriction is in force on a basic allowance of 1¼ kilos per tappable tree.

Hevea Selection

Work on selecting Hevea in the experimental gardens belonging to the Government Rubber Estates is discussed by J. G. J. A. Maas in the *Archief v. d. Rubber,* who states these gardens cover about 256 hectares, in which are planted about 350 clones of various origin, including 260 L.C.B. (Government Rubber Estates) clones. The L.C.B. clones, planted in 1926 and 1927, were developed from 260 specially selected trees, among which some of the younger ones gave 5½ times higher output than the average tree in the tapping tasks where these trees happened to be. The average output per tree per annum over 3 years reached a maximum of 15 kilos; while the highest yielding trees gave more than 30 kilos per annum.

Efforts are also directed toward finding suitable stocks and clones with special qualities, as those resistant to mildew. As a result of experimentation in the latter connection it has been found that clone L.C.B. 870 is practically resistant to mildew. On the Government Rubber Estates, too, eighteen families have been developed from crossings; a fairly large number of seedlings developed from clonal seeds is being tested; while a number of isolated gardens of buddings have been established, seeds from which have already been used for artificial crossings.

A clone attracting much attention is L.C.B. 1,320 planted in one of the testing gardens at Tjipetir and also at Balong. The Tjipetir garden is laid out on hilly, rather poor soil, and about 50 buddings from each of ten different L.C.B. clones have been planted here in 1926. Nearby, on somewhat better soil, two more clones A.V. 36 and A.V. 52 have been planted in order to study the comparative merits of the latter and the L.C.B. clones. L.C.B. 1,320 was one of the first clones to reach the tapping stage and during the first year gave the unusual yield of 3½ kilos (7.7 pounds) of dry rubber per tree, which was considerably more than that obtained from two other L.C.B. clones and the two A.V. clones which became tappable at about the same time. Since then the yield has continued to increase and is now said to be 60 grams dry per tapping day so that it is expected that by the end of the second tapping year, L.C.B. 1,320 will have given an output of 6 to 7 kilos per tree. At Balong this clone is also found to be among the best yielders. The tree grows well on inferior soils and matures early. Incidentally, it has been observed that among other clones planted at Balong in 1927 there are some that promise to equal L.C.B. 1,320.

Hevea Cuttings

Hitherto all attempts in rubber growing centers to propagate Hevea from cuttings have failed, Dr. Bobilioff recalls in a recent communication from the General Experiment Station of the A.V.R.O.S. Curiously enough, he relates, a nurseryman in Bussum, Holland, Mr. Gersie, some years ago informed him that he had worked out a method of developing Hevea from cuttings from plants grown in hot-houses. A number of rubber scientists from experiment stations in Java and Sumatra, in Holland on leave, visited Bussum and found that Mr. Gersie had actually succeeded, as he claimed, in obtaining Hevea plants from cuttings and that these plants had strong and well-developed root systems.

Subsequently experiments in this direction were also conducted in Sumatra. These at first gave negative results, but latterly a method has been developed whereby cuttings with well-developed root systems have been grown.

So far the tests have given good results only with young seedlings a few months old, having two pairs of leaves with a completely lignified internode. Slipping cannot be done directly. A piece of wire must first be twisted around the stem in the internode just above the lower pair of leaves and drawn so tightly as to cut into the wood. Subsequently a swelling develops above the ligature, and after twenty days the seedling can be slipped by cutting off the top part immediately below the swelling and planting in a box filled with a mixture of black earth and sand. About half of each leaf should be cut away, and the box covered with glass. Roots begin to develop about three weeks after planting. A few of the cuttings were transplanted in pots and beds as soon as the roots began to form. A fairly long time elapsed before the slip began to grow and new apical shoots developed.

Tests on older Hevea trees have so far been unsuccessful.

In view of the results obtained, it is a pity that Mr. Bobilioff has found himself forced to interrupt his interesting experiments, and it is to be hoped that others will continue where he left off.

Creaming Latex

At a planters' meeting at the Hall of the A.V.R.O.S., Dr. van Harpen discussed a new patent for creaming latex. This patent, No. 29,774, dated April, 1933, is in the name of the A.V.R.O.S. It refers to a method of creaming latices of Hevea or other rubber bearing plants by means of agents like alkaline carbonate bases, extracts of vegetable mucilage, or other colloidal substances. The feature of the patent is that before the creaming agent is added the dispersed rubber particles are dehydrated by subjecting the latex to the action of steam or formaline. The latex may or may not be compounded in the usual way. The creaming effect obtained may be supported by centrifugation.

From the economical point of view, Dr. van Harpen pointed out, sodium hydroxide is the most suitable anti-coagulant to use in connection with this process as it is by far the cheapest and the easiest to obtain locally. A variety of creaming agents is available, including the tragacanths, pectin, Carragheen, ammonium alginate, Tragon seed gum, and a Japanese hemicellulose preparation. The good tragacanths are too expensive, but Tragon seed gum, although not quite so satisfactory, has the advantage of being a commercial product that can always be obtained of constant composition and is, moreover, very cheap. The cost on a kilo of dry rubber works out at 0.44 cents (Netherland currency). Dr. van Harpen further advises that in the above process the soap to be used, when sodium hydroxide is employed, should preferably be potash soap.

Ceylon

Ceylon's imports of manufactured rubber goods have averaged about 3,500,000 rupees annually over the last three or four years. A large portion of this sum goes for imported footwear, flooring, molded goods, waterproof

clothing, toys, and similar articles, which could very well be produced locally. Efforts in this direction have been made in the past, but failed because of lack of technical experience.

Now the manufacture of rubber goods is to be started again, this time on an experimental scale in a factory erected for the Rubber Research Scheme on Dartonfield Estate, Agalawatte, and recently opened by the Governor of Ceylon.

Dartonfield Estate, covering 178 acres, was acquired by the Rubber Research Scheme in 1933 to extend its plantation experiments. The new factory consists of two sections, one for the preparation of crude rubber and the other to test its processing qualities and to investigate the possibilities of producing rubber goods locally. This half is equipped with a small-scale manufacturing and vulcanizing plant. It is planned to concentrate efforts first on a single product with others to follow if the initial experiments prove successful. The experience thus gathered will prove of value to persons or concerns contemplating the manufacture of rubber articles here.

In the section for preparing crude rubber the usual forms will be put out, crepe and sheet; in addition, research work in modified forms of rubber will be carried on and the handling of latex studied. Among the new types to be considered is crumb rubber. To make this the coagulum is broken up into wet crumb by a small high-speed disintegrator and subsequently dried in a rotary drier through which air is blown.

So far Ceylon has not been very active in shipping latex. The Research Scheme is to study the technique of preserving and storing it in order to be of assistance to estates planning to ship liquid latex. When results of certain tests conducted in other rubber centers become known, apparatus for concentrating latex will also be installed, and work will be undertaken in this direction too.

Besides the factory a chemical laboratory equipped for physical and chemical examination of raw and vulcanized rubber has also been built.

Ceylon has figured out that its productivity has been considerably underestimated. Whereas the International Rubber Regulation Committee fixed the highest basic quota for this country at 82,000 tons, a more accurately assessed standard production for Ceylon would have been nearly 105,000 tons, it is claimed.

Malaya

One of the less desirable effects of restriction, as far as Singapore is concerned, is the considerable decline in remilling. Although several plants were established in Netherland India several years ago, most of the native rubber produced there continued to be sent to Singapore because it was more profitable to do so. Now, however, the Dutch natives are preparing more dry rubber, and the Dutch Government is encouraging them to produce a better grade. As a result, the Singapore business finds itself hard hit. Already two big rubber remilling concerns in Singapore have been forced to cease operating and liquidate.

The importance of the trade in the past may be gaged from the fact that until recently the ten large remilling firms in Singapore worked about 12,000 piculs (1,600,000 pounds) of wet rubber daily, while they were in a position to handle up to 25,000 piculs (about 3,330,000 pounds) a day, and their monthly turnover came to $1,000,000 (Straits currency). But if the remilling business is bad, the smoking business is experiencing a boom, for although Dutch native rubber is now dry, it is for the most part still unsmoked. It is reported that at least nine new smoke houses have been installed, each capable of treating 480 to 720 piculs of rubber at a time (that is 64,000 to 96,000 pounds).

A report by the Department of Agriculture regarding the native industry during 1934 reveals the total output from this source for the year was 217,093 tons. Of this amount 62,499 tons were produced in the first quarter, 50,425 in the second, 50,352 in the third, and 53,817 in the fourth quarter. The distribution of the total follows: 104,141 tons from the F.M.S.; 81,459 tons from the U.M.S., and 31,403 tons from the S. S.

Tapping increased somewhat during the year so that the untapped area in the F.M.S. was 41,000 acres at the end of December, 1934, against 42,600 acres at the end of September, 1934; while in the S. S., the figures were 11,600 and 13,900 respectively.

There seems to have been an improvement in the upkeep of small holdings due to the fear of low assessment for overgrown areas. Moldy rot caused a certain amount of trouble in the wet months of October and November, but the dry weather in December assisted control. In view of the fact that small holdings have usually been held to suffer comparatively little from root diseases, it is worth noting that persisting reports have been received from Perak on damage from root disease.

A large part of the native rubber produced in Malaya still comes unsmoked. In Perak the Asiatic rubber instructor has been attempting to bring home to the small holders the advisability, under the present rubber regulation, of selling only fully dried smoked sheet and has pointed out the loss they incur in selling wet rubber covered by coupons up to its full wet weight.

British Malaya

An official cable from Singapore to the Malayan Information Agency, Malaya House, 57 Charing Cross, London, S.W.1, England, gives the following figures for March, 1935:

Rubber Exports: Ocean shipments from Singapore, Penang, Malacca, and Port Swettenham

	March, 1935	
To	Sheet and Crepe Rubber Tons	Latex, Concentrated Latex, Revertex, and Other Forms of Latex Tons
United Kingdom	9,315	324
United States	22,367	550
Continent of Europe	6,723	293
British possessions	1,432	52
Japan	5,547	17
Other countries	782	5
Totals	46,166	1,241

Rubber Imports: Actual, by Land and Sea

	March, 1935	
From	Dry Rubber Tons	Wet Rubber Tons
Sumatra	1,623	3,590
Dutch Borneo	1,880	1,564
Java and other Dutch islands	287	5
Sarawak	1,508	123
British Borneo	451	17
Burma	154	7
Siam	1,466	610
French Indo-China	19	44
Other countries	85	4
Totals	7,473	5,964

Shipments of Crude Rubber from Producing Countries

Year	Malaya Including Brunei and Labuan	N.E.I.	Ceylon	India	Burma	North Borneo	Sarawak	Siam	French Indo-China	Philippines and Oceania Total	Oceania	Africa	South America	Mexican Guayule	Grand Total
1925	210,000	189,000	45,700	6,300	4,700	5,400	9,000	4,600	7,400	482,100	700	7,800	30,200	4,000	524,800
1926	286,000	204,000	58,800	6,500	4,500	5,800	10,000	3,500	8,100	587,200	1,000	9,500	26,700	4,000	628,400
1927	242,000	229,000	55,400	7,000	5,800	6,600	11,000	4,700	8,900	570,400	1,300	8,500	30,800	5,000	616,000
1928	299,000	229,000	58,000	7,200	4,800	7,000	11,000	4,100	9,100	629,200	1,300	7,500	21,600	3,000	662,600
1929	457,000	255,000	80,300	7,900	5,500	7,400	11,300	4,300	9,500	838,200	900	6,300	21,300	1,300	868,000
1930	443,000	241,000	75,600	6,800	5,200	7,100	10,300	4,700	9,700	803,400	1,200	4,900	14,300	1,000	824,800
1931	423,000	257,000	62,300	5,400	4,200	6,200	10,500	3,600	11,000	783,200	900	3,500	12,200	0	799,800
1932	406,000	211,000	49,300	1,100	3,000	5,400	7,000	3,000	13,500	699,300	800	2,100	6,500	0	708,700
1933	445,800	280,800	63,800	1,500	3,400	7,800	10,900	7,000	15,900	836,900	1,100*	2,000	10,100	0	850,100
1934	467,030	378,125	79,068	5,568	5,719	11,086	17,450	17,714	19,280	1,001,040	1,233*	3,107	9,143	398	1,014,921
1935															
Jan.	41,677	18,574	6,267	1,549	945	1,238	1,574	2,614	2,575	77,013	100	350*	1,000	0	78,463
Feb.	33,034	27,807	5,551	331	489	760	1,922	2,288	2,018	74,200	100	300*	1,357	0	75,957

* Estimate. Source: *Statistical Bulletin of the International Rubber Regulation Committee.*

Patents and Trade Marks

MACHINERY

United States

19,496 (Reissue). **Plastic Article Mold.** W. G. Lawson, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

1,992,213. **Sole Preparer.** A. S. Johnson, Beverly, Mass., assignor to United Shoe Machinery Corp., Paterson, N. J.

1,992,250. **Cutting Die.** E. W. Stacey, Beverly, Mass., assignor to United Shoe Machinery Corp., Paterson, N. J.

1,993,082. **Sheet Rubber Blank Former.** G. W. Blair and R. R. Hunt, assignors to Mishawaka Rubber & Woolen Mfg. Co., all of Mishawaka, Ind.

1,993,384. **Extruder.** V. E. Royle, Paterson, N. J.

1,993,393. **Material Measurer and Cutter.** H. Willshaw, Wylde Green, H. Smith, Sutton Coldfield, and G. H. B. Yoxon, Birmingham, all in England, assignors to Dunlop Tire & Rubber Corp., Buffalo, N. Y.

1,993,435. **Cold Rubber Vulcanizer.** W. Court, Brondesbury, England.

1,993,967. **Blanking Machine.** H. M. Koelliker, Pontiac, Mich., assignor to Baldwin Rubber Co., a corporation of Mich.

1,994,137. **Slitter.** C. W. Leguillon, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

1,994,178. **Molded Article Trimmer.** P. A. Raiche, Providence, R. I., assignor to Davol Rubber Co., a corporation of R. I.

1,994,278. **Rubber Soled Footwear Apparatus.** T. Halsall, Middleton, and J. Prior, Rochdale, both in England.

1,994,327. **Tester.** W. E. Sykes, assignor to Farrel-Birmingham Co., Inc., both of Buffalo, N. Y.

1,994,561. **Tire Builder.** H. C. Bostwick, Coventry Township, assignor to Akron Standard Mold Co., Akron, both in O.

1,994,568 and 1,994,569. **Shoe Last.** G. C. Clark, Beverly Hills, Calif.

1,994,570 and 1,994,571. **Shoe Last Mold.** G. C. Clark, Beverly Hills, Calif.

1,994,572. **Jointed Member Casting Apparatus.** G. C. Clark, Beverly Hills, Calif.

1,994,573. **Jointed Shoe Last Casting Apparatus.** G. C. Clark, Beverly Hills, Calif.

1,994,776. **Sheet Material Cutter.** O. W. Lewis and J. Durst, both of Los Angeles, Calif., assignors, by mesne assignments, to Van Cleef Bros., Chicago, Ill.

1,995,061. **Tester.** W. B. Hanford and E. B. Erickson, both of Detroit, Mich., assignors, by mesne assignments, to United States Rubber Co., New York, N. Y.

Dominion of Canada

348,330. **Rubber Thread Apparatus.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands, assignee of J. R. Gammeter, Akron, O.

348,362. **Article Embosser and Vulcanizer.** S. Hansen, assignee of P. Hansen, both of Flushing, L. I., N. Y., U. S. A.

348,728. **Universal Clamp.** Wingfoot Corp., Wilmington, Del., assignee of W. O. Christy, Akron, O., both in the U. S. A.

348,737. **Mold Reproduction.** J. W. Harding, So. Bend, Ind., U. S. A.

348,757. **Rubberized Fabric Apparatus.** W. J. Dean, No. Kansas City, Mo., U. S. A.

348,828. **Mold.** Canadian National Carbon Co., Ltd., Toronto, Ont., assignee of E. F. Kiefer, Cleveland, O., U. S. A.

348,841. **Tire Vulcanizing Mold.** Dunlop Tire & Rubber Goods Co., Ltd., Toronto, Ont., assignee of H. Willshaw and T. Norcross, co-inventors, both of Birmingham, England.

348,851. **Sheet Material Looper.** B. F. Goodrich Co., New York, N. Y., assignee of C. H. Heldenbrand, U. C. Haren, and F. Slusher, co-inventors, all of Akron, O., all in the U. S. A.

United Kingdom

419,165. **Web Feeder, Cutter, and Deliverer.** Dunlop Rubber Co., Ltd., London.

419,530. **Web Feeder.** Firestone Tyre & Rubber Co., Ltd., Brentford; G. A. Williamson, High Wycombe; and P. Holmes and J. Blackwood, both of Southall.

419,555. **Vulcanizing Core.** Dunlop Rubber Co., Ltd., London, and B. W. D. Lacey and L. Palmer, both of Birmingham.

420,123. **Tire Molding Press.** Summit Mold & Machine Co., Akron, O., U. S. A., assignee of J. W. Brundage.

420,151. **Roller Mill.** Dunlop Rubber Co., Ltd., London, and H. Willshaw, Birmingham.

420,829. **Tire Retreader.** J. H. Mayhew, Minneapolis, Minn., U. S. A.

Germany

610,712. **Tire Mold.** A. Pohl, Berlin-Lichtenrade.

611,417. **Method and Apparatus for Producing Thread from Aqueous Dispersions.** Dunlop Rubber Co., Ltd., London, England, and the Anode Rubber Co., Ltd., St. Peter's Port, Channel Islands. Represented by C. and E. Wiegand, both of Berlin.

PROCESS

United States

19,475 (Reissue). **Shoe Repair Material.** R. R. Bollman, Mt. Washington, and C. L. Ornes, Cincinnati, assignors to Perfect Mfg. Co., Cincinnati, all in O.

19,494 (Reissue). **Compound Ventilated Fabric.** A. A. Glidden, Watertown, and V. H. Bodle, Newton, assignors to Hood Rubber Co., Inc., Watertown, all in Mass.

1,992,386. **Footwear.** J. M. Miller and A. R. Davis, both of Hudson, assignors to Firestone Footwear Co., Boston, all in Mass.

1,992,448. **Covered Elastic Thread.** H. A. Smith, Needham, assignor to Frank W. Gorse Co., Needham Heights, both in Mass.

1,992,514. **Inner Tube.** R. S. Taylor, P. M. Torrance, and R. H. Anderson, assignors to Firestone Tire & Rubber Co., all of Akron, O.

1,992,589. **Organic Fiber.** G. R. Tucker, No. Andover, and L. W. Isom, Belmont, assignors to Dewey & Almy Chemical Co., No. Cambridge, all in Mass.

1,992,976. **Curved Composite Glass.** G. B. Watkins, assignor to Libbey-Owens-Ford Glass Co., both of Toledo, O.

1,993,212. **Rubber Goods from Latex.** J. Edwardes, assignor to Heveatex Corp., both of Melrose, Mass.

1,993,233. **Rubber Goods from Latex.** G. W. Winchester, W. Haven, Conn., assignor to Heveatex Corp., Melrose, Mass.

1,993,277. **Rubber Goods.** E. A. Murphy, A. Niven, and D. F. Twiss, all of Birmingham, assignors to Dunlop Rubber Co., Ltd., London, all in England.

1,993,278. **Rubber Goods.** E. A. Murphy and D. F. Twiss, assignors to Dunlop Rubber Co., Ltd., all of Birmingham, England.

1,993,279. **Rubber Goods.** E. A. Murphy and E. W. Madge, both of Birmingham, assignors to Dunlop Rubber Co., Ltd., London, all in England.

1,993,290. **Cellular Rubber.** D. F. Twiss and W. McCowan, both of Birmingham, assignors to Dunlop Rubber Co., Ltd., London, all in England.

1,993,523. **Ornamentation.** A. B. Pöschel, assignor to Decorative Development, Inc., both of Brooklyn, N. Y.

1,993,524. **Printing and Dyeing.** A. B. Pöschel, assignor to Decorative Development, Inc., both of Brooklyn, N. Y.

1,993,596. **Rubber Goods from Latex.** J. B. Crockett, Malden, assignor to Heveatex Corp., Melrose, both in Mass.

1,994,145. **Composite Article.** G. B. Moule, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

1,994,165. **Composite Product.** C. L. Beal, Cuyahoga Falls, assignor to American Anode, Inc., Akron, both in O.

1,994,317. **Rubber Article.** C. E. Linscott, Saugus, Mass., assignor, by mesne assignments, to United States Rubber Co., New York, N. Y.

1,994,534. **Inductance Coil.** F. E. Robinson, Colchester, England, assignor to Radio Corp. of America, a corporation of Del.

1,994,619. **Oil-Resisting Rubber Article.** B. D. Porritt, T. R. Dawson, and J. R. Scott, assignors to Research Association of British Rubber Manufacturers, all of Croydon, England.

1,994,763. **Rubber Article.** W. E.

Gardner, assignor to Gardner Toy Co., Inc., both of Watertown, Mass.

1,994,979. **Friction Material.** S. Collier, Waukegan, Ill., assignor to Johns-Manville Corp., New York, N. Y.

Dominion of Canada

348,286. **Sheet Fiber Product.** Brown Co., assignee of M. O. Schur, both of Berlin, N. H., U. S. A.

348,287. **Artificial Leather.** Brown Co., assignee of M. O. Schur, both of Berlin, N. H., U. S. A.

348,332. **Squeaking Rubber Article.** Magyar Ruggyantaárugyár Részvénytársaság, assignee of P. Vincze, both of Budapest, Hungary.

348,487. **Chlorinated Rubber Product.** Imperial Chemical Industries, Ltd., London, assignee of J. P. Baxter, Widnes, both in England.

348,493. **Rubber Film.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands, assignee of C. E. Linscott, Saugus, Mass., and H. de B. Rice, Barrington, R. I., co-inventors, both in the U. S. A.

348,494. **Rubber Thread.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands, assignee of R. Weston, Cuyahoga Falls, O., U. S. A.

348,670. **Textile Material Impregnation.** Filastic, Ltd., assignee of P. Schidrowitz, both of London, England.

348,676. **Rubber and Fiber Material.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands, assignee of E. W. Madge and F. J. Payne, co-inventors, both of Birmingham, England.

348,677. **Rubber Goods.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands, assignee of D. F. Twiss and W. McCowan, co-inventors, both of Birmingham, England.

348,678. **Toy Figure.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands, assignee of R. Stangel, Budapest, Hungary.

348,679. **Rubber Article.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands, assignee of E. W. Madge, E. A. Murphy, and F. J. Payne, co-inventors, all of Birmingham, England.

348,923. **Printing Blanket.** L. Smith, Lombard, Ill., co-inventor with and assignee of F. O. A. Fogel, Grand Haven, Mich., both in the U. S. A.

United Kingdom

419,292. **Purifying Rubber Solutions.** Minister of Communications of the Imperial Japanese Government, Tokyo, Japan.

419,482. **Ball.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands, and D. F. Twiss and W. McCowan, both of Birmingham.

419,704. **Coloring Rubber.** Dunlop Rubber Co., Ltd., London, and J. S. Tidmus, Birmingham.

419,839. **Uniting Rubber and Iron.** L. Mellersh-Jackson, London. (Naugatuck Chemical Co., Naugatuck, Conn., U. S. A.)

419,901. **Compound Sheet Material.** Soc. of Chemical Industry in Basle, Basle, Switzerland, assignee of G. E. Landt, Norristown, Pa., U. S. A.

419,902. **Sponge Rubber.** L. Rado, Berlin, Germany.

420,163. **Cellular Rubber.** J. A. Howard, London.

420,170. **Upholstery Pads.** M. Smith, Long Eaton.

420,250. **Article Protective Packing.** J. J. V. Armstrong, Liverpool. (Copeman Laboratories Co. and L. G. Copeman, both of Flint, Mich., U. S. A.)

420,324. **Molding Articles.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands, and F. W. Warren, Manchester.

420,330. **Ornamenting Rubber.** Dunlop Rubber Co., Ltd., London, and J. S. Tidmus, Birmingham.

420,334. **Plastic Vulcanizable Material.** M. J. Stam, The Hague, Holland.

420,401. **Adhesive.** W. W. Triggs, London. (H. G. Halloran, Milton, Mass., U. S. A.)

420,786. **Mattress Inner Hose-like Fabric.** Optimit Gumove A Textilni Zavody Akciova Spolecnost, Odry, Czechoslovakia.

420,836. **Artificial Leather.** E. I. du Pont de Nemours & Co., Wilmington, Del., U. S. A.

Germany

610,515. **Bleaching, Tinting, and Dressing Elastics, Braids, Etc.** Gompara G.m.b.H., Krefeld.

610,671. **Seamless, Hollow Rubber Goods.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands. Represented by R. and M. M. Wirth and C. Weihe, all of Frankfurt a.M., and T. R. Koehnhoen, Berlin.

610,933. **Molded Goods.** H. Schweoger, Sr., Berlin-Britz, and E. Engel, Berlin.

611,345. **Obtaining Rubber Particles from Rubber Dispersions and Solutions.** A. J. A. Y. de Schepper, The Hague, Holland. Represented by C. Wagener.

611,381. **Tire Covers without Fabric Inserts.** Hessische Gummiwarenfabrik Fritz Peter A.G., Kleinauheim b. Hanau a.M.

611,590. **Shoes Wholly or Partly of Rubber.** I. and L. Dorogi and Magyar Ruggyantaarugyar R. T., all of Budapest, Hungary. Represented by J. Reitstotter, Berlin-Steglitz.

CHEMICAL

United States

19,487 (Reissue). **Organic Reaction Product.** J. C. Patrick, Trenton, N. J.

1,993,276. **Rubber Composition.** E. A. Murphy and A. Niven, both of Birmingham, England, assignors to Dunlop Rubber Co., Ltd., a British corporation.

1,993,280. **Rubber Composition.** E. A. Murphy and A. Niven, assignors to Dunlop Rubber Co., Ltd., all of Birmingham, England.

1,993,803. **Accelerator.** D. H. Powers, Pennsgrove, N. J., assignor to E. I. du Pont de Nemours & Co., Wilmington, Del.

1,993,913. **Chlorinated Rubber.** W. Becker, Cologne-Mulheim, and A. Blömer, Imbach, assignors to I. G. Farbenindustrie A. G., Frankfurt a. M., all in Germany.

1,994,328. **Creaming Latex.** R. F. Tefft, Nutley, N. J., assignor, by mesne assignments, to United States Rubber Co., New York, N. Y.

1,994,412. **Cork Substitute.** V. G. Walsh, Stanmore Park, England.

1,994,503. **Rubber Dispersion Product.** W. H. Chapman, D. W. Pounder, E. A. Murphy, and F. T. Purkis, all of Birmingham, assignors to Dunlop Rubber Co., Ltd., London, all in England.

1,994,731. **Accelerator.** L. B. Sebrell, Silver Lake, and A. M. Clifford, Stow, both in O., assignors to Wingfoot Corp., Wilmington, Del.

1,994,732. **Accelerator.** L. B. Sebrell, Cuyahoga Falls, O., assignor to Wingfoot Corp., Wilmington, Del.

1,994,927. **Accelerator.** R. L. Sibley, Nitro, W. Va., assignor to Rubber Service Laboratories Co., Akron, O.

1,995,179. **Artificial Leather.** B. Holm, Clifton, N. J., assignor, by mesne assignments, to United States Rubber Co., New York, N. Y.

Dominion of Canada

348,533. **Rubber Surface Treatment.** W. C. Geer, Ithaca, N. Y., assignee of J. W. Baymiller, Springfield, Mass., both in the U. S. A.

348,561 and 348,562. **Road, Sidewalk, and Floor Composition.** H. W. Cowling, Redhill, England.

348,568. **Tire Puncture Sealing Solution.** M. Hagino, Vancouver, B. C.

348,672. **Cotton Cord Preserver.** Goodyear Tire & Rubber Co., Akron, assignee of L. B. Sebrell, Silver Lake, both in O., U. S. A.

348,729. **Denture Base.** Wingfoot Corp., Wilmington, Del., assignee of H. R. Thies, Akron, O., both in the U. S. A.

348,823. **Vulcanized Asphalt Oil.** Canadian Industries, Ltd., Montreal, P. Q., assignee of H. S. Holt, Wilmington, Del., U. S. A.

United Kingdom

419,293. **Paint.** E. I. du Pont de Nemours & Co., Wilmington, Del., U. S. A.

419,357. **Latex Product.** Triplex Safety Glass Co., Ltd., London, and L. V. D. Scorah and J. Wilson, both of Birmingham.

419,496. **Rubber Composition.** S. Perez, London. (O. Blumberg, Paris, France.)

419,588. **Wetting Agent.** I. G. Farbenindustrie A. G., Frankfurt a. M., Germany.

419,611. **Varnish.** J. Y. Johnson, London. (I. G. Farbenindustrie A. G., Frankfurt a. M., Germany.)

419,728. **Chlorinated Rubber.** J. P. Baxter, Farnworth, and Imperial Chemical Industries, Ltd., London.

419,801. **Plastic Composition.** Chemieprodukte Ges., Berlin, Germany.

419,826. **Films of Polyvinyl Compounds.** J. Y. Johnson, London. (I. G. Farbenindustrie A. G., Frankfurt a. M., Germany.)

419,840. **Rubber Composition.** L. Mellersh-Jackson, London. (Naugatuck Chemical Co., Naugatuck, Conn., U. S. A.)

420,116. **Rubber Composition.** Dunlop Rubber Co., Ltd., London, and D. F. Twiss, A. S. Carpenter, and A. E. T. Neale, all of Birmingham.

420,181 and 420,221. **Plasticizer.** H. Dreyfus, London.

420,386. **Rubber Composition.** Dunlop Rubber Co., Ltd., London, and D. F. Twiss and A. E. T. Neale, both of Birmingham.

420,545. **Wetting Agent.** I. G. Farbenindustrie A. G., Frankfurt a. M., Germany.

420,626. **Hardening Ball Surfaces.** Dunlop Rubber Co., Ltd., London, and D. F. Twiss and F. A. Jones, both of Birmingham.

420,643. **Fireproofing Rubber.** Soc. H. & F. De Poix & Cie., Seine-et-Oise, France.
420,747. **Adhesive.** W. Zeitlin, London.
420,760. **Coating Composition.** H. Bennett, Brooklyn, N. Y., U. S. A.
420,852. **Accelerator.** Dunlop Rubber Co., Ltd., London, and D. F. Twiss, D. J. Hadley, and F. A. Jones, all of Birmingham.
420,883, 420,884, 420,897, and 420,903. **Wetting Agent.** I. G. Farbenindustrie A. G., Frankfurt a. M., Germany.
420,912. **Porous Rubber Composition.** Deutsche Gold-Und Silber-Scheideanstalt Vorm. Roessler, Frankfurt a. M., Germany.
421,055. **Coloring Rubber.** E. I. du Pont de Nemours & Co., Wilmington, Del., U. S. A.
421,146. **Artificial Mass.** I. G. Farbenindustrie A. G., Frankfurt a. M., Germany.

Germany

610,898. **Polyvinyl Esters Soluble in Organic Solvents.** I. G. Farbenindustrie A.G., Frankfurt a.M,
611,380. **Stabilizing Chlorinated Rubber.** I. G. Farbenindustrie A.G., Frankfurt a.M.
611,522. **Coloring Rubber.** I. G. Farbenindustrie A.G., Frankfurt a.M.
611,642. **Separating Rubber from Aqueous Dispersions by Electrodes of Different Materials.** Siemens-Elektro-Osmose G.m.b.H., Berlin-Siemensstadt.

GENERAL

United States

1,992,490. **Nozzle.** A. P. Lewis, assignor to Firestone Tire & Rubber Co., both of Akron, O.
1,992,495. **Flexible Valve Member.** E. B. Lynde, Middleboro, Mass.
1,992,506. **Rail-Car Truck.** C. Saurer, assignor to Firestone Tire & Rubber Co., both of Akron, O.
1,992,528. **Flexible Coupling.** H. D. Geyer, Dayton, O., assignor, by mesne assignments, to General Motors Corp., Detroit, Mich.
1,992,648. **Feet Medicament Applier.** W. W. Browne, Yonkers, N. Y.
1,992,665. **Rubber-Fabric Material.** E. Hazell, assignor, by mesne assignments, to United States Rubber Co., both of New York, N. Y.
1,992,679. **Typewriter Power Driven Eraser.** H. B. Swan, Wadhams, N. Y.
1,992,724. **Buffer.** A. Spencer, London, England.
1,992,764. **Air Valve.** I. D. Perry, assignor to A. S. Perry, both of Chicago, Ill.
1,992,845. **Corset and Brassiere.** M. M. Solomon, New York, N. Y.
1,992,907. **Flexible Insulating Sheet.** W. A. Boughton, Cambridge, assignor to New England Mica Co., Waltham, both in Mass.
1,993,018. **Artificial Lure.** F. J. Pfeifle, Willoughby, O., assignor of one-half to J. L. Smith.
1,993,067. **Splash Guard.** L. M. Littlefield, Chicopee Falls, Mass., assignor, by mesne assignments, to Fisk Rubber Corp., a corporation of Del.
1,993,090. **Ball.** W. G. Curry, Springfield, Mass., assignor to A. G. Spalding & Bros., New York, N. Y.
1,993,094. **Universal Joint.** F. M. Guy, assignor to Guy & Murton, Inc., both of Detroit, Mich.
1,993,208. **Shoe.** A. Cohn, St. Louis, Mo.
1,993,227. **Tire Valve Stem and Valve.** C. S. Preston, San Diego, Calif.
1,993,228. **Yieldable Seat.** R. W. Sampson, assignor to C. J. Hardy, both of New York, N. Y.
1,993,307. **Test Plug.** M. D. Nicholson, Cleveland, O.
1,993,526. **Submarine Communication Cable.** W. Rihl, Berlin-Eichkamp, assignor to Siemens & Halske A. G., Siemensstadt, both in Germany.
1,993,629. **Syringe and Ampule.** A. E. Smith, Los Angeles, Calif.
1,993,630. **Syringe.** A. E. Smith, Los Angeles, Calif.
1,993,662. **Toothbrush Attachment.** H. A. Green, Jersey City, N. J.
1,993,671. **Foundation Garment.** M. Kahn, Cedarhurst, N. Y.
1,993,676. **Panties.** R. A. Manny and J. A. Rielly, both of New York, N. Y.
1,993,718. **Coating Apparatus.** G. A. Miner, Medford, Mass., assignor to United Shoe Machinery Corp., Paterson, N. J.
1,993,923. **Salt Water Shower.** A. Eccardt, Brooklyn, N. Y.
1,994,013. **Interchangeable Heel.** E. Christensen, Portland, Ore.
1,994,027. **Depressible Traffic Signal.** G. R. Poston, assignor of 51% to E. E. Groves, both of Gastonia, N. C.
1,994,122. **Heel Cover.** J. Cirone and L. Franchina, both of Chicago, Ill.
1,994,127. **Water Bottle.** F. Fenton, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.
1,994,139. **Rubber Covered Metal Tubing.** A. D. Maclachlan, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.
1,994,144. **Cathode Insulation.** A. B. Merrill, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.
1,994,154. **Footwear.** N. E. Tousley, Waban, assignor to Hood Rubber Co., Inc., Watertown, both in Mass.
1,994,199. **Fly Swatter.** L. Osterkamp, Cheviot, O.
1,994,202. **Aerial Toy.** J. M. Sarsfield, Chicago, Ill.
1,994,234. **Ventilated Mattress.** M. Sherover, New York, N. Y.
1,994,293. **Insulator.** J. J. Taylor, Barberton, assignor to Ohio Brass Co., Mansfield, both in O.
1,994,309. **Typewriter.** G. G. Going, Glenbrook, Conn., assignor to Remington Rand, Inc., New York, N. Y.
1,994,359. **Brassiere.** B. Greenbaum, Cleveland, O.
1,994,361. **Pipe Joint Gasket.** H. F. Johnson, assignor to Champion Machine & Forging Co., both of Cleveland, O.
1,994,415. **Jar Holder and Cap Wrench.** C. Edwards, Lehighton, and P. F. Murray, Beaver Meadows, both in Pa.
1,994,587. **Flexible Hose.** T. Nakane, Yokohama, Japan, assignor to B. F. Goodrich Co., New York, N. Y.
1,994,681. **Insole Layer.** J. Blumenfeld, Ebernburg (Pfalz), Germany.
1,994,738. **Windshield Wiper.** O. C. Ritz-Woller, Chicago, Ill.
1,994,759. **Cushion.** W. Dermott, assignor to Van Cleef Bros., both of Chicago, Ill.
1,994,781. **Massage Device.** G. A. Mutch, Belleville, N. J.
1,994,790. **Inflatable Article Valve.** W. E. Roedding, Grand Rapids, Mich., assignor, by mesne assignments, to Van Cleef Bros., Chicago, Ill.
1,994,842. **Balloon.** C. T. Turner, Lakefield, Ont., Canada.
1,994,962. **Plant Package.** V. L. Rushfeldt, Albert Lea, Minn.
1,994,998. **Compass Compensating Device.** W. E. Hull, Warren, O.
1,995,051. **Teat Tube.** R. S. Benson, Detroit, Mich.
1,995,058. **Top Lift Attachment.** J. F. Fitzsimmons, Belmont, assignor to Fitz-On Sales Corp., Boston, both in Mass.
1,995,088. **Automobile Bumper.** W. D. Bellamy, assignor of one-half to O. T. Brightwell, both of Henderson, Tex.
1,995,245. **Insulated Joint.** R. B. Funk, Washington, D. C.
1,995,261. **Roll Top Stocking Garter.** C. W. Gidney, assignor of one-tenth to C. M. Matthews and one-third to E. G. Hewitt, all of Los Angeles, Calif.
1,995,283. **Milking Apparatus Inflation Tube.** J. A. Schmitt, assignor to Universal Milking Machine Co., both of Waukesha, Wis.

Dominion of Canada

348,238. **Colostomy Belt.** M. A. Bowman, Rochester, Minn., U. S. A.
348,250. **Panel Mounting.** L. G. Hunter, Flushing, N. Y., U. S. A.
348,260. **Button Cover.** L. E. Thompson, Toronto, Ont.
348,306. **Elevator Door Mechanism.** Canadian Westinghouse Co., Ltd., Hamilton, Ont., assignee of H. V. McCormick, Winnetka, Ill., U. S. A.
348,309. **Inflator.** Dill Mfg. Co., Cleveland, assignee of J. C. Crowley, Cleveland Heights, both in O., U. S. A.
348,339. **Glass Plate Polisher.** Pilkington Brothers, Ltd., Liverpool, assignee of J. H. Griffin, Moss Bank, both in England.
348,358. **Brassiere.** Warner Bros. Co., assignee of L. Lax, both of Bridgeport, Conn., U. S. A.
348,389. **Tire.** E. R. Case, Toronto, Ont.
348,420. **Mat.** L. F. Schuhmacher, Chicago, Ill., U. S. A.
348,478. **Golf Club.** Clifton, Ltd., Douglas, Isle-of-Man, assignee of H. D. Fitzpatrick, Glasgow, Scotland.
348,485. **Skipping Rope.** B. F. Goodrich Co., New York, N. Y., U. S. A., assignee of C. W. Beaman, Kitchener, Ont.
348,505. **Floor Covering.** Ohio Rubber Co., assignee of B. Bronson, both of Cleveland, O., U. S. A.
348,616. **Holder.** American Steel & Wire Co. of N. J., Cleveland, O., assignee of O. A. McNamee and C. P. Vaill, co-inventors, both of Worcester, Mass., all in the U. S. A.
348,707. **Toy Building Blocks.** Rubber Specialties Co., Inc., Conshohocken, assignee of E. E. Tompkins, Haverford, both in Pa., U. S. A.
348,716. **Railway Truck Spring.** T. H. Symington & Son, Inc., Baltimore, assignee of E. R. Symington, Lutherville, and T. R. Symington, Reisterstown, executors of the estate of T. H. Symington, deceased, in his lifetime of Baltimore, all in Md., U. S. A.
348,721. **Fabric and Footwear.** United States Rubber Co., New York, assignee of P. Adamson, Rye, both in N. Y., U. S. A.
348,734. **Flexible Pipe Coupling.** J. H. Hayes, assignee of W. B. Damsel, both of New York, N. Y., U. S. A.

348,785. **Clinical Thermometer Shield.** M. D. McKichan, Toronto, Ont.

348,866. **Fountain Pen. David Kahn,** Inc., assignee of S. G. Yates, both of No. Bergen, and D. Kahn, Woodcliff, co-inventors, all in N. J., U. S. A.

348,868. **Fluid Valve.** Leyland & Birmingham Rubber Co., Ltd., assignee of H. J. Butcher, both of Leyland, England.

348,869. **Magnetic Interrupter.** P. R. Mallory & Co., Inc., Indianapolis, Ind., assignee of W. P. Lear, New York, N. Y., and M. E. Nulsen, Indianapolis, Ind., co-inventors, all in the U. S. A.

348,892. **Doll Joint.** Sun Rubber Co., assignee of M. S. Lower, both of Barberton, O., U. S. A.

348,910. **Nipple.** A. Gareau, Manseau, inventor, and E. Clouette, Montreal, assignee of one-half the interest, both in P. Q.

United Kingdom

418,137. **Air Compressor.** Bristol Pneumatic Tools, Ltd., and H. C. C. Wescombe, both of Bristol.

418,390. **Shock Absorber.** Dunlop Rubber Co., Ltd., London, and B. W. D. Lacey and P. J. Bawcutt, both of Birmingham.

418,402. **Vehicle Axle Assembly.** J. Zubaty, Plzen, Czechoslovakia.

418,553. **Semitrailer Coupling.** Curtiss Aerocar Co., Inc., Opalocka, Fla., U. S. A., assignee of H. H. and H. A. Robinson.

418,594. **Spinning Machine Ring Flyer.** W. Whiteley, Elland.

418,606. **Chain-link Mat.** J. Hawley & Co. (Walsall), Ltd., and J. L. Gasking, both of Walsall.

418,668. **Cable.** K. Herkenberg, Oberbarmen, Germany.

418,698. **Aircraft.** A. G. Coats, London, and R. Hafner, Vienna, Austria.

418,781. **Resilient Mounting.** Humber, Ltd., and N. M. Wishart, both of Coventry.

418,799. **Window Regulator.** H. G. V. Rydahl, Viggbyholm, Sweden.

418,849. **Cycle Battery Attachment.** E. H. Humphries, Birmingham.

418,857. **Tap Union.** A. R. Willmott, Surrey.

418,863. **Vibration Damper.** L. Gardner & Sons, Ltd., and J. H. S. Gardner, both of Manchester.

418,864. **Mop Wringer.** G. H. Rotherham, London.

418,925. **Engine Mounting.** E. P. Renaux, Paris, and L. J. Renaux, Seine-et-Oise, both in France.

418,946. **Cable.** Siemens-Schuckertwerke A. G., Berlin, Germany.

419,018. **Typewriter.** Royal Typewriter Co., Inc., New York, N. Y., assignee of B. J. Dowd, W. Hartford, Conn., both in the U. S. A.

419,023. **Reservoir Brush.** A. Arnegger, Rhineland, Germany.

419,075. **Thread Treater.** E. Berl, Pittsburg, Pa., U. S. A.

419,083. **Brush.** R. H. G. Fowler and F. J. Mundy, both of Glamorgan, Wales.

419,121. **Optical Apparatus.** K. G. Stern, London.

419,133. **Web Feeder.** Jagenbergwerke A. G., Düsseldorf, Germany.

419,142. **Accumulator.** J. Lucas, Ltd., and J. Merrick, both of Birmingham.

419,200. **Flexible Diaphragm.** J. Dewrance, London.

419,267. **Milk Tin Emptier.** O. Billian, Zurich, Switzerland.

419,277. **Compound Sheet Material Device.** T. Rowbotham, W. Shaw, and T. Rowbotham & Co., Ltd., all of Stockport.

419,291. **Vehicle Suspension System.** C. Macbeth, Birmingham.

419,336. **Handle Bar.** Norton Motors, Ltd., and A. Carroll, both of Birmingham.

419,382. **Tobacco Stemmer.** E. Quester, Cologne, Germany.

419,456. **Soap Holder.** W. Wiggin, Bloxwich.

419,488. **Electric Cable.** Siemens & Halske A. G., Berlin, Germany.

419,512. **Child's Walk Teaching Appliance.** M. R. Clark, Leeton, N. S. W., Australia.

419,515. **Horse Velocipede.** Chace Fashion Export Bureau and A. Chace, both of Paris, France.

419,533. **Retractive Switch.** W. H. Scott, Norwich.

419,539. **Airplane Roof.** R. O. Mobbs, Slough.

419,556. **Syringe Plunger.** F. Twells, Liverpool.

419,562. **Vehicle Spring Suspension.** Daimler-Benz A. G., Stuttgart, Germany.

419,584. **Vehicle Wheel.** Soc. Italiana Pirelli, Milan, Italy.

419,589. **Gramophone Pickup Mounting.** Electrical Research Products, Inc., New York, assignee of H. C. Harrison, Port Washington, both in N. Y., U. S. A.

419,646. **Target.** E. B. Schauman and B. L. Lerche, both of Helsinki, Finland.

419,650. **Self-Closing Valve.** E. Fernholz, Berlin, Germany.

419,682. **Book Support.** J. R. Shattock and P. C. Yannedis, both of London.

419,683. **Optical Sound Recorder.** Radio Corp. of America, New York, N. Y., U. S. A.

419,702. **Vacuum Cleaner.** O. Grave, Berlin, Germany.

419,713. **Wash Basin.** J. Dessar, London.

419,743. **Surgical Truss.** J. W. Paramore, Sheffield.

419,761. **Tire.** Dunlop Rubber Co., Ltd., London, and A. Healey, Birmingham.

419,764. **Metal Electrodeposition.** Anaconda Copper Mining Co., New York, N. Y., assignee of C. E. Yates, Perth Amboy, N. J., both in the U. S. A.

419,772. **Automobile Air Deflector.** W. L. Morrison, Chicago, Ill., U. S. A.

419,775. **Web Feeder.** Forgrove Machinery Co., Ltd., and F. Grover, both of Leeds.

419,854. **Vacuum Pump.** J. Treloar, Hamilton, New Zealand.

419,903. **Tree Felling Apparatus.** G. Poppett, Glamorgan, Wales.

419,912. **Suspensory Bandage.** Johnson & Johnson (Gt. Britain), Ltd., Slough. (Johnson & Johnson, New Brunswick, N. J., U. S. A.)

419,956. **Cow Milker.** J. H. Davis, Melbourne, Australia.

419,986. **Springs.** H. & F. De Poix & Cie., Seine-et-Oise, France.

420,046. **Rubber Ring.** J. Stockhammer, Baden, Austria.

420,134. **Mop.** T. Sendler, Stettin, Germany.

420,168. **Hair Curler.** L. Mellersh-Jackson, London. (Beauty Utilities, Inc., Summit, N. J., U. S. A.)

420,169. **Table Game.** K. C. G. De Vall, Birmingham.

420,177. **Boot Protector.** L. Lansdell, London.

420,189. **Dish Washer.** C. H. Williams, Grays; A. R. Greenslade, Tilbury; and J. J. and J. J., Jr., Naish, both of Grays.

420,208. **Glove Lamp Mounting.** H. W. Howe, No. Harrow.

420,231. **Mercury-Vapor Rectifier.** General Electric Co., Ltd., London, and E. Gallizia, Birmingham.

420,232. **Optical Instrument.** C. Zeiss and R. Straubel, both of Jena, Germany.

420,239. **Grinding and Polishing Block.** W. E. Tollworthy and L. F. Murray, both of Birmingham.

420,240. **Cable.** Naamlooze Vennootschap Hollandsche Draad-En Kabelfabriek, Amsterdam, Holland.

420,264. **Brush.** W. A. Schwab, Chicago, Ill., U. S. A.

420,292. **Air Cushion.** D. Moseley & Sons, Ltd., and A. H. C. Randall, both of Manchester.

420,314. **Golf Club.** W. Johnson, Manchester.

420,321. **Garters.** I. B. S. Craig, London.

420,365. **Dental Syringe.** S. S. White Dental Mfg. Co., Philadelphia, Pa., U. S. A.

420,373. **Web Festooner.** Carrier-Ross Engineering Co., Ltd., London, and S. Ward, Orpington.

420,410. **Golf Ball.** W. C. Burbank, New York, N. Y., U. S. A.

420,440. **Liquid Meter.** J. B. Benaiges, I. R. Boes, and M. B. Creus, all of Barcelona, Spain.

420,447. **Conductor.** Standard Telephones & Cables, Ltd., London. (Western Electric Co., Inc., New York, N. Y., U. S. A.)

420,515. **Brassiere.** J. Greig and R. E. C. De Pury, both of London.

420,568. **Cable Terminal.** G. E. Liljekvist, Stockholm, Sweden.

420,604. **Bottle Plug Closure.** D. Moseley & Sons, Ltd., and G. E. Bermingham, both of Manchester.

420,610. **Teething Pad Attachment.** R. L. Peniston, Croydon.

420,613. **Electric Lamp Holder.** A. Fischesser, Bas-Rhin, France.

420,615. **Soft Collar.** W. Hughes, Chadderton.

420,624. **Sliding Seat.** H. L. Sleigh and A. S. Cheston, both of Birmingham.

420,644. **Floor Covering.** J. Buder, Spremberg, Germany.

420,655. **Bicycle Tire Pump.** E. Schmitz, Solingen, and A. Brugger, Barmen, both in Germany.

420,714. **Cable.** Pirelli-General Cable Works, Ltd., London, and J. L. Bishop, Southampton.

420,730. **Pipe Joint.** Vereinigte Stahlwerke A. G., Düsseldorf, Germany.

420,758. **Ironer.** Baker Perkins, Ltd., and S. Newbery, both of Peterborough.

420,768. **Gravity Separation Apparatus.** S. E. T. Ewing and J. L. Willey, both of Johannesburg, South Africa.

420,778. **Lathe.** D. Gilson & Co., Ltd., and A. F. J. Wright, both of London.

420,797. **Cushion.** E. L. W. Byrne, London. (H. & F. De Poix & Cie., Seine-et-Oise, France.)

420,798. **Electric Radiator.** H. Frost & Co., Ltd., and A. W. Moss, both of Walsall.

420,814 and 420,865. **Ice Tray.** R. L. Hallock, Larchmont, N. Y., U. S. A.

420,882. **Washing Machine.** P. Schulz, Magdeburg, Germany.

420,918. **Bath Waste Plug.** A. G. Westmoreland, Birmingham.

(*Continued on page* 72)

ADVERTISING PAGES REMOVED

Market Reviews

CRUDE RUBBER

Commodity Exchange

TABULATED WEEK-END CLOSING PRICES

Futures	Mar. 2	Mar. 30	Apr. 6	Apr. 13	Apr. 20
Mar.	12.60	.....	.....	.....	.....
Apr.	12.62	11.09	10.99	11.55	11.65
May	12.67	11.20	11.07	11.63	11.74
July	12.80	11.35	11.20	11.78	11.84
Sept.	12.94	11.50	11.34	11.93	11.97
Dec.	12.23	11.72	11.60	12.13	12.19
Feb.	13.41	11.88	11.75	12.28	12.33
Mar.	.....	.....	11.82	12.36	12.41
Volume for week (tons)	...29,249	26,640	11,840	14,700	13,590

THE above table gives the nearest first and last week-end closing prices of the month previous to that under review, also the week-end closing prices of each week of this review. This plan permits tracing at a glance the trend of prices on representative futures for approximately two consecutive months.

Week ended March 30. The International Rubber Regulation Committee unexpectedly lowered the restriction export quotas from 75 to 70%. News of this action caused a rapid upturn in the prices of futures and a volume of trading March 26 of 11,750 long tons, the most active dealing of the year. When fixing the 75% basic export quotas, February 26, the I.R.R.C. announced its reserved right to effect changes any time conditions should warrant. This right was exercised to raise rubber prices to a point that would show a profit to the producer, since the consistent decline of the past month had resulted in prices too low for that. The seriousness of the labor situation in Akron took on a degree of importance during the remainder of the week that more than offset the trading optimism resulting from the restriction decision; therefore the market was reasonably dull, with declining prices that offset nearly half the 125- to 132-point gains of the Tuesday session. The week closed, however, somewhat steadier and 57 to 61 points above the previous week's close.

Week ended April 6. Firmness and a 15- to 22-point price rise characterized trading during the opening day of this period. Losses and gains alternated by days during the remainder of the week, which closed 10 to 15 points below the previous week; April 10.99¢ and July 11.20¢ against 10.09¢ and 11.35¢ respectively the week before. Refusal of the Akron tire companies to deal with the union, the N.L.R.B.'s entry into the dispute, and the tire plants preparations for what seemed to be an inevitable strike caused a decided lack of aggressiveness in trading quarters. This was intermittently offset by such developments as advancing British exchange rates and reports of reduced Malayan exports in March. Malay shipped 22,367 tons of rubber to the United States in March against 26,573 in February, 29,232 in January, and 32,145 in March, 1934.

Week ended April 13. The labor situation in Akron continued to affect the market bearishly, causing price declines until April 9 when Secretary Perkins was reported to have arranged to confer with prominent officials of the rubber industry and later when the President was said to have instructed her to "take any steps which are essential" to avert the strike. These reports, the resulting meeting, favorable restriction statistics, and the upward adjustment of silver price changed trading sentiment and reversed the price trend to close the period with advances of 53 to 59 points. A Reuter cable quoted the "Dutch Indian" Press to the effect that native planting restrictions had been repeatedly infringed, but wherever it was known to be intentional, especially in West Java, the transgressors have been severely penalized.

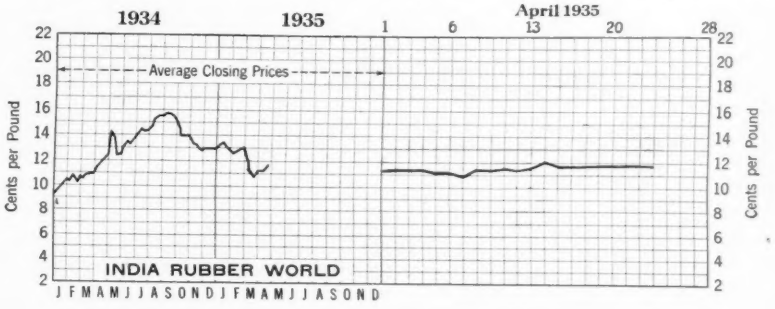
Week ended April 20. A truce, effected over the week-end, between the Akron tire manufacturers and the union definitely eased the tension in the industry as well as in market circles here and abroad, thus causing the period to open with active short covering, some reinstatement of speculation, and price advances of 28 to 35 points. Dullness marked the following pre-holiday sessions as a result of weakened foreign markets and almost total lack of activity in the outside market, which resulted from the large tire stocks in Akron and the approach of the low production season. Four to 11 points over the close of the previous week were registered as the Commodity Exchange closed April 18 until after Easter. A large warehouse of the New York Dock Co. in Brooklyn burned April 20. Approximately ½ million pounds of rubber were destroyed.

Moderate activity April 22, ascribed to the Brooklyn warehouse fire Saturday, advanced rubber 8 to 12 points to May 11.83¢ from 11.72 the previous close. A bearish condition followed, which was influenced by the suspension of grain trading April 24, the result of the failure of a large grain elevator concern, causing a downward trend of prices with rubber closing, April 24, 10 to 25 points below closing prices on Monday.

New York Outside Market

The 13¢ price level of No. 1 smoked sheet that prevailed for many weeks prior to the I.R.R.C. action February 26, retaining 75% as the basis for Far Eastern exports, gave way to consistent declines during all but the last week of March. The price trend of this movement from its beginning to late in April is portrayed by the following week-end closing prices: February 23, 13 7/16¢; March 2, 12 5/8; March 9, 11 11/16; March 16, 11½; March 23, 10⅞; March 30, 11 3/16; April 6, 11 3/16; April 13, 11 3/16; April 20, 11 11/16.

Week ended March 30. At the opening of this period, March 25, consuming centers were attracted but slightly by offers 1/16¢ under the transaction prices. With the announcement March 26 of the I.R.R.C.'s unexpected reduction of the export basic quota to 70%, a sudden demand by factories, both large and small, reversed the price trend with an advance of 1 3/16¢ from 10⅜ to 11¾. The remainder of the period was marked by reduced outside interest as apprehension regarding the labor situation in Akron became more apparent. Price recessions resulted, but the period closed with an advance of 5/16¢ over the previous week's close. The revision of export duties fixed 70% as an export quota for April, May, and June and 65% for the remainder of the year so as to produce 750,000 tons of



New York Outside Market—Spot Closing Prices Ribbed Smoked Sheets

permissible exports during 1935 against actual exports of 1,014,000 tons in 1934.

Week ended April 6. Activity in the outside market during this period was the smallest in many months due to the expectation of strikes interfering with production in the large Akron tire factories. Goodyear, Goodrich, and Firestone, having refused the union's request of recognition, placed the latter in the position of taking a strike vote. The local union of Goodyear workers, having voted several days ahead of the others, announced their intention to walk out. The local unions of Firestone and Goodrich workers were voting as the week closed, and a similar decision was taken for granted. The N. L. R. B. announced that it had abandoned all efforts to avert a strike. Under these tense conditions other kinds of rubber news were of no interest, and prices fluctuated but little, closing the week at 11 1/16¢, 1/16¢ below the previous week's close.

Week ended April 13. Starting with a 1/16¢ decline, sentiment quickly responded to favorable developments in the Akron labor situation, bringing an active demand from the factory trade which advanced the No. 1 smoked sheet price 1/16¢, April 9, to 11 3/16¢, and continued the rise that closed the period at 11 1/16¢. Secretary of Labor Frances Perkins, with the President's support, engaged the rubber company officials in a series of conferences with developments which led Miss Perkins to state "the strike picture is not quite so black." Restriction news reflected a downward trend in dealers' stocks in the Colonies: March totaled 50,171 tons; February, 56,679; January, 55,841; and 54,000 tons in March, 1934.

Week ended April 20. A truce was effected between the conflicting parties in the Akron labor controversy during the week-end which provides for open negotiations between employers and representatives of the United Rubberworkers' Union on matters of complaint, hours, wages, and working conditions pending a ruling by the courts on the legality of employes' election. If such negotiations do not end satisfactorily, Secretary of Labor Perkins will refer the matter to a fact-finding board.

With the tension thus relieved spot rubber advanced 1/16¢, which yielded later as factories prepared to taper off production of tires for the seasonal decline. The chairman of R.G.A. forecast a greatly increased world use of rubber. He thinks it reasonable that the increase during the next ten years will equal that of the past similar period. 1924 absorption was 471,000 tons against 930,000 tons in 1934.

The R.M.A. reported 42,620 tons of rubber consumed in the United States during March, which compares with 43,187 in February, a decrease of 1.3% and 9.5% respectively, under March, 1934.

A fair factory demand prevailed which raised the No. 1 smoked sheet price to 11 7/16¢ April 22, but was influenced sufficiently by the futures market condition to cause a recession during the next two days to 11 11/16¢.

New York Quotations

New York outside market rubber quotations in cents per pound

Plantations	Apr. 25, 1934	Mar. 25, 1935	Apr. 26, 1935
Rubber latex, normal ..... *gal.*	60	48	50 1/4
Sheet			
Ribbed smoked, spot	12 1/2	10 5/8	11 3/4 / 11 13/16
May-June	12 5/8	.....	11 7/8
July-Sept.	12 7/8	10 7/8 / 10 13/16	12 / 12 1/16
Oct.-Dec.	13 1/4	11 5/8 / 11 7/8	12 1/4 / 12 5/16
Crepe			
No. 1 thin latex, spot	14 1/2 / 14 5/8	11 / 11 1/8	12 / 12 1/16
May-June	14 5/8 / 14 3/4	....	12 1/8 / 12 3/16
July-Sept.	14 7/8 / 15	11 1/4 / 11 1/2	12 1/4 / 12 1/2
Oct.-Dec.	15 1/4 / 15 1/2	11 1/2 / 11 3/4	12 1/2 / 12 13/16
No. 3 Amber, spot	10 1/4 / 10 3/8	9 5/8 / 9 3/4	10 5/8 / 10 3/4
No. 1 Brown	10 3/8 / 10 1/2	9 5/8 / 9 7/8	10 3/4 / 10 7/8
Brown rolled	7 3/4 / 8	9 3/8 / 9 5/8	10 3/8 / 10 1/2
Paras			
Upriver fine	10 1/2	9	9 1/4
Upriver fine	*13 1/4	*11 1/2	*12 3/4
Upriver coarse	7	6 3/4	8
Upriver coarse	*10 1/4	*10	*10
Islands fine	10	8 3/4	10 1/2
Islands fine	*13 1/4	*11	*12 1/2
Acre, Bolivian fine	10 3/4	9 1/4	9 1/2
Acre, Bolivian fine	*13 1/2	*11 3/4	*13
Beni, Bolivian	10 1/2	9 3/4	9 3/4
Madeira fine	10 1/2	9	9 1/4
Caucho			
Upper ball	7	6 3/4	8
Upper ball	*10 1/4	*10	*10
Lower ball	6	6 1/2	7 1/2
Pontianak			
Bandjermasin	6	6	6
Pressed block	11	10/11	10
Sarawak	6	6	6
Manicobas			
Manicoba, 30% guar.	†6 1/4	..	..
Mangabiera, thin sheet	..	..	..
Guayule			
Duro, washed and dried	..	12	12
Ampar	..	13	13
Africans			
Rio Nuñez	..	12	12
Black Kassai	..	10	10
Prime Niger flake	..	25	25
Gutta Percha			
Gutta Siak	10 1/2	9 1/2	9 3/4
Gutta Soh	15	13	14
Red Macassar	1.35	1.25	1.25
Balata			
Block, Ciudad Bolivar	38	34	32
Manaos block	38	26	30
Surinam sheets	43	36	35
Amber	47	42	37

*Washed and dried crepe. Shipments from Brazil. †Nominal.

GENERAL

United Kingdom

(*Continued from page* 68)

420,934. **Golf Club.** Kroydon Co., Inc., Maplewood, N. J., U. S. A.

420,940. **Trouser Waistband.** G. G. Levy, London.

420,953. **Tire Inflator.** K. A. and E. H. Widegren, both of Lidingö, Sweden.

420,968. **Cigarette Container.** R. N. Booth, London.

420,970. **Pulp Molder.** R. P. Wilson, London.

421,073. **Cable.** Pirelli-General Cable Works, Ltd., London, and J. L. Bishop, Southampton.

421,112. **Cow Milker.** G. H. Gascoigne, Wokingham, and J. R. Knox, Reading.

421,282. **Windscreen Wiper.** Harris & Sheldon, Ltd., Birmingham, and D. Dunnett, Wembley.

421,322. **Heel Cushion.** J. McLuskie, Glasgow, Scotland.

Germany

611,569. **Closure for Hot Water Bottles, Etc.** Continental Gummi-Werke A.G., Hannover.

TRADE MARKS

United States

322,045. **Arrabuk.** Rubber and fiber sheet material. Hood Rubber Co., Inc., Wilmington, Del.

322,262. **Flatab.** Garters. Narrow Fabric Co., W. Reading, Pa.

322,301. **"Itsyouth."** Brassieres, garter belts, girdles, corsets, and hose supporters. W. F. Moore, doing business as Moore Elastic Products Co., Glendale, Calif.

322,333. **Duphax.** Vulcanized vegetable oil. Stamford Rubber Supply Co., Stamford, Conn.

322,349. **Jaytho Lastique.** Corsets, brassieres, and combinations thereof. Jay-Thorpe, Inc., New York, N. Y.

322,374. **T D A.** Rubber dispersing medium, etc. Dewey & Almy Chemical Co., Cambridge, Mass.

(*Concluded on page* 80)

New York Outside Market—Spot Closing Rubber Prices—Cents per Pound

	March, 1935						April, 1935															
	25	26	27	28	29	30	1	2	3	4	5	6	8	9	10	11	12	13	15	16	17	18	19*	20*
No. 1 Ribbed Smoked Sheet	10 3/8	11 3/4	11 5/8	11 1/2	11 1/16	11 1/16	11 1/16	11 1/4	11 1/4	11 1/4	11 1/16	11 1/16	10 13/16	11 3/16	11 3/16	11 1/16	11 1/16	11 1/16	12	11 3/4	11 13/16	11 13/16	..	..
No. 2 Ribbed Smoked Sheet	10	11 3/8	11 1/4	11 1/8	10 13/16	10 13/16	10 13/16	10 7/8	10 7/8	10 7/8	10 13/16	10 13/16	10 7/16	11	11	11 1/16	11 1/16	11 1/16	11 1/16	11 1/16	11 1/4	11 1/4	..	..
No. 3 Ribbed Smoked Sheet	9 7/8	11 1/4	11 1/8	11	10 7/16	10 13/16	10 13/16	10 3/4	10 3/4	10 3/4	10 7/16	10 7/16	10 7/16	10 7/8	10 7/8	11 1/16	10 13/16	11 1/16	11 1/16	11 1/16	11 1/8	11 1/8	..	..
No. 4 Ribbed Smoked Sheet	9 3/4	11 1/8	11	10 7/8	10 7/16	10 7/16	10 13/16	10 5/8	10 5/8	10 5/8	10 7/16	10 7/16	10 7/16	10 3/4	10 3/4	10 13/16	10 13/16	10 13/16	11 1/16	11 1/16	11	11	..	..
No. 1 Thin Latex Crepe	10 5/8	12 1/16	11 13/16	11 13/16	11 3/8	11 1/2	11 5/8	11 1/16	11 1/16	11 1/16	11 3/8	11 3/8	11 1/4	11 13/16	11 13/16	11 7/8	11 3/4	10 7/8	12 1/4	12	12	12	..	..
No. 1 Thick Latex Crepe	10 1/2	11 13/16	11 13/16	11 13/16	11 1/4	11 3/8	11 1/2	11 1/16	11 1/16	11 1/16	11 1/4	11 1/4	11 1/8	11 1/16	11 1/16	11 3/4	11 5/8	10 3/4	12 1/8	11 7/8	11 7/8	11 7/8	..	..
No. 1 Brown Crepe	9 5/8	10 13/16	10 7/8	10 3/4	10 1/4	10 3/8	10 1/2	10 7/16	10 3/8	10 1/4	10 7/16	10 7/16	9 13/16	10 3/8	10 3/8	10 13/16	10 7/16	10 13/16	11	10 3/4	10 3/4	10 3/4	..	..
No. 2 Brown Crepe	9 1/2	10 3/16	10 3/4	10 5/8	10 1/8	10 1/4	10 3/8	10 7/16	10 1/4	10 1/8	9 13/16	9 13/16	9 13/16	10 1/4	10 1/4	10 7/16	10 7/16	10 7/16	10 7/8	10 5/8	10 5/8	10 5/8	..	..
No. 2 Amber	9 5/8	10 3/16	10 7/16	10 3/4	10 1/4	10 3/8	10 1/2	10 7/16	10 3/8	10 1/4	10 7/16	10 7/16	9 13/16	10 3/8	10 3/8	10 13/16	10 7/16	10 13/16	11	10 3/4	10 3/4	10 3/4	..	..
No. 3 Amber	9 1/2	10 1/16	10 3/4	10 5/8	10 1/8	10 1/4	10 3/8	10 7/16	10 1/4	10 1/16	9 13/16	9 13/16	9 13/16	10 1/4	10 1/4	10 7/16	10 7/16	10 7/16	10 7/8	10 5/8	10 5/8	10 5/8	..	..
No. 4 Amber	9 3/8	10 1/16	10 1/2	10 3/8	10	10 1/8	10 1/4	10 7/16	10 1/8	10	9 13/16	9 13/16	9 13/16	10 1/16	10 1/16	10 7/16	10 7/16	10 7/16	10 5/8	10 3/16	10 3/16	10 3/8	..	..
Rolled Brown	9 1/4	10 1/2	10 3/8	10 1/4	9 7/8	10	10 1/8	10 7/16	10	9 13/16	9 3/4	9 3/4	9 5/8	10	10	10 7/16	10 1/4	10 3/8	10 3/8	10 1/4	10 1/4	10 1/4	..	..

*Holiday.

COMPOUNDING INGREDIENTS

THE generally active demand for the compounding ingredients that prevailed during the first quarter of the year was sharply curtailed in the Akron district early in April owing to labor troubles centering in that area. Active demand for materials was quickly resumed following agreement on a pending settlement soon after the middle of the month.

Rubber goods production in all lines is reported fair to good in volume, with probability of continued improvement for the balance of the second quarter.

ACCELERATORS AND ANTIOXIDANTS. A new general-purpose antioxidant appears in the market this month. It is called Age-Rite Syrup and by its physical state, chemical action, and freedom from blooming tendency fills a definite need in the rubber industry.

CARBON BLACK. The demand was well maintained by all rubber plants except those at Akron during the interval of the uncertainty over the labor situation.

LITHARGE. Prices advanced slightly the last of March and again about a month later when it reached 5.20¢ a pound. Demand by the rubber trade was moderate and seasonal.

LITHOPONE. Fair demand was again evident, following clearing of the Akron situation.

RUBBER SOLVENTS. The relief of the Akron labor situation caused resumption of the previously prevailing active demand especially by the tire plants.

SOFTENERS. The demand has been fair and steady in all the popular lines of plasticizers and softeners.

TITANIUM. This pigment is very much sought for, and producers will soon be in position to satisfy the demands from the rubber as well as the paint trade.

ZINC OXIDE. Rubber manufacturers' demand is well maintained and gaining in volume.

New York Quotations

April 26, 1935

Prices Not Reported Will Be Supplied on Application

Abrasives		
Pumicestone, powdered	lb.	$0.01¼/$0.03½
Rottenstone, domestic	lb.	.02½/ .05
English	ton	
Silica, 15	ton	
Tripoli	lb.	.02¼/ .03
Accelerators, Inorganic		
Lime, hydrated	ton	20.00
Litharge (commercial)	lb.	.06¾/ .06½
Magnesia, calcined, heavy	lb.	.04
carbonate	lb.	.06½
Accelerators, Organic		
A-1	lb.	.21 / .25
A-5-10	lb.	.33 / .36
A-10	lb.	
A-11	lb.	.60 / .75
A-16	lb.	.55 / .65
A-19	lb.	.56 / .75
A-32	lb.	.70 / .80
A-77	lb.	
Accelerator 49	lb.	.40 / .50
87	lb.	
122	lb.	
552	lb.	
808	lb.	
833	lb.	
Aerin	lb.	
Aldehyde ammonia	lb.	
Altax	lb.	
Beutene	lb.	
Butyl Zimate	lb.	
C-P-B	lb.	
Captax	lb.	
Crylene	lb.	
Paste	lb.	
D-B-A	lb.	
Di-Esterex	lb.	
Di-Esterex-N	lb.	
DOTG	lb.	.44 / .54
D.O.T.T.U.	lb.	
DPG	lb.	.35 / .45
Esterex	lb.	
Ethylideneaniline	lb.	
Formaldehyde P.A.C.	lb.	
Formaldehydeaniline	lb.	
Formaldehyde-para-toluidine	lb.	
Guantal	lb.	.42 / .51
Hepteen	lb.	
Base	lb.	
Hexamethylenetetramine	lb.	
Lead oleate, No. 999	lb.	.115
Witco	lb.	.11
Methylenedianilide	lb.	
Monex	lb.	
Novex	lb.	
Pipsolene	lb.	
R-2	lb.	1.50 / 1.90
Base	lb.	4.55 / 5.00
R & H 50-D	lb.	
Safex	lb.	
Super-sulphur No. 1	lb.	
No. 2	lb.	
Tepidone	lb.	
Tetrone A	lb.	
Thiocarbanilide	lb.	
Thionex	lb.	
Trimene	lb.	
Base	lb.	
Triphenyl guanidine (TPG)	lb.	
Tuads	lb.	
Ureka	lb.	.62 / 1.00
Blend B	lb.	
C	lb.	$0.58 /$0.69
Vulcanex	lb.	
Vulcanol	lb.	
Vulcone	lb.	
Z-B-X	lb.	
Z-88-P	lb.	.48 / .60
Zenite	lb.	
A	lb.	
B	lb.	
Zimate	lb.	
Acids		
Acetic 28% (bbls.)	100 lbs.	2.45 / 2.70
glacial (carboys)	100 lbs.	14.00
Sulphuric, 66°	ton	15.50
Activator		
Barak	lb.	
Age Resisters		
Age-Rite Gel	lb.	
HP	lb.	
Powder	lb.	
Resin	lb.	
Syrup	lb.	
White	lb.	
Akroflex A	lb.	
B	lb.	
C	lb.	
Albasan	lb.	
Antox	lb	
A-V-A-R	lb.	
B-L-E	lb.	
Flectol B	lb.	
H	lb	
White	lb.	
M-U-F	lb.	
Neozone (standard)	lb.	
A	lb.	
C	lb.	
D	lb.	
E	lb.	
Oxynone	lb.	
Parazone	lb.	
Permalux	lb.	
Solux	lb.	
V-G-B	lb.	
Alkalies		
Caustic soda, flake, Columbia (400 lb. drums)	100 lbs.	3.00 / 4.00
liquid, 50%	100 lbs.	2.25
solid (700 lb. drums)	100 lbs.	2.60 / 3.60
Antiscorch Materials		
Antiscorch 1	lb.	
Retarder B	lb.	
W	lb.	
R. H. Cumar	lb.	.085
U-T-B	lb.	
Antisun Materials		
Heliozone	lb.	
Sunproof	lb.	
Binders, Fibrous		
Asbestos	ton	30.00
Brake Lining Saturants		
B. R. C. No. 553	lb.	.015 / .017
B. R. T. No. 3	lb.	.015 / .017
Colors		
BLACK		
Bone (Quality Group No. 1)	lb.	.11½/ .12
Lampblack (commercial)	lb.	$0.07 /$0.15
BLUE		
Brilliant	lb.	
Prussian	lb.	.36½
Toners	lb.	.80 / 3.50
Ultramarine, dry, Group 1	lb.	.14
BROWN		
Mapico	lb.	.13
Sienna, Italian, raw (Quality Group No. 1)	lb.	.12½
GREEN		
Brilliant	lb.	
Chrome, light	lb.	.20
medium	lb.	.20
oxide	lb.	.18½/ .23½
Dark	lb.	
Guignet's	lb.	.70
Light	lb.	
Toners	lb.	.85 / 3.50
ORANGE		
Lake	lb.	
Toners	lb.	.40 / 1.60
ORCHID		
Toners	lb.	1.50 / 2.00
PINK		
Toners	lb.	1.50 / 4.00
PURPLE		
Permanent	lb.	
Toners	lb.	.60 / 2.00
RED		
Antimony		
Crimson, R. M. P. No. 3	lb.	.46
Sulphur free	lb.	.48 / .50
Golden 15/17%	lb.	.30 / .35
7-A	lb.	.33
Z-2	lb.	.20
Cadmium	lb.	.75 / .80
Chinese	lb.	
Crimson	lb.	
Iron Oxides		
Rub-Er-Red	lb.	.09¼
Mapico	lb.	.09¾
Medium	lb.	
Scarlet	lb.	
Toners	lb.	.80 / 2.00
WHITE		
Lithopone (bags)	lb.	.04½/ .04¾
Albalith Black Label-11	lb	.04½/ .04¾
Astrolith (5-ton lots)	lb.	.04½/ .04¾
Azolith	lb.	.04½/ .04¾
Cryptone-19	lb.	.06 / .06¼
CB-21	lb.	.06 / .06¼
Sunolith (5-ton lots)	lb.	.04½/ .04¾
XX-20 Zinc Sulphide	lb.	.10½/ .10¾
86	lb.	.10½/ .10¾
Rayox	lb.	
Titanolith (5-ton lots)	lb.	.06 / .06¼
Titanox-A	lb.	.17 / .18¾
B	lb.	.06 / .06½
C	lb.	.06 / .06½
Ti-Tone	lb.	
Zinc Oxide		
Anaconda, Lead Free No. 352	lb.	.05¾/ .06
Green Seal No. 333	lb.	.09⅜/ .09⅝
No. 570	lb.	.05¾/ .06
No. 577	lb.	.05¾/ .06
Red Seal No. 222	lb.	.08⅜/ .08⅝

New York Quotations

April 26, 1935

Prices Not Reported Will Be Supplied on Application

Zinc Oxide (*Cont'd*)		
U.S.P. No. 777 (bbls.)	*lb.*	$0.12¼
White Seal No. 555	*lb.*	.10⅝
Azo ZZZ-11	*lb.*	.05¾/$0.06
44	*lb.*	.05¾/ .06
55	*lb.*	.05¾/ .06
66	*lb.*	.05¾/ .06
French Process, Florence		
White Seal-7 (bbls.)	*lb.*	.10⅝
Green Seal-8	*lb.*	.09⅝/ .09⅝
Red Seal-9	*lb.*	.08⅜/ .08⅜
Kadox, Black Label-15	*lb.*	.09⅜/ .09⅜
Blue Label-16	*lb.*	.08⅜/ .08⅜
Red Label-17	*lb.*	.07 / .07¼
Horse Head Special-3	*lb.*	.05¾/ .06
XX Red-4	*lb.*	.05¾/ .06
23	*lb.*	.05¾/ .06
72	*lb.*	.05¾/ .06
78	*lb.*	.05¾/ .06
80	*lb.*	.05¾/ .06
103	*lb.*	.05¾/ .06
110	*lb.*	.05¾/ .06
St. Joe (lead free)		
Black Label No. 20 (bags)	*lb.*	.05¾
Green Label No. 42 (bags)	*lb.*	.05¾
Red Label No. 30 (bags)	*lb.*	.05¾
U.S.P. X (bbls.)	*lb.*	.12½
YELLOW		
Cadmium	*lb.*	.40 / .45
Lemon	*lb.*	
Mapico	*lb.*	.09½
Ocher, domestic (Quality Group A)	*lb.*	.02¾
Toners	*lb.*	2.50

Dispersing Agents

Bardex	*lb.*	.023 / .025
Bardol	*lb.*	.021 / .023
Darvan	*lb.*	

Factice—See Rubber Substitutes

Fillers, Inert

Asbestine, c.l., f.o.b. mills	*ton*	15.00
Barytes	*ton*	30.00
f.o.b. St. Louis	*ton*	22.50
off color, domestic	*ton*	22.50 /25.00
white, imported	*ton*	32.50 /35.00
Blanc fixe, dry, precip.	*ton*	70.00 /75.00
pulp	*ton*	42.50 /45.00
Calcene	*ton*	35.00 /45.00
Infusorial earth	*lb.*	.03 / .05
Kalite No. 1	*ton*	
No. 3	*ton*	
Suprex, white, extra light	*ton*	45.40 /60.00
heavy	*ton*	45.40 /60.00
Whiting		
Chalk precipitated	*lb.*	.04¼/ .04¾
Columbia brand	*ton*	9.00 /14.00
Domestic	100 *lbs.*	
Hakuenka	*lb.*	
Paris white, English cliff-stone	100 *lbs.*	
Southwark Brand, Commercial	100 *lbs.*	
All other grades	100 *lbs.*	
Sussex	*ton*	
Witco, c.l.	*ton*	7.00
Wood flour (f.o.b. New Hampshire)	*ton*	20.00 /50.00

Fillers for Pliability

Flex	*lb.*	
Fumonex, c.l., f.o.b works, bags	*lb.*	.03
l.c.l., f.o.b. warehouse	*lb.*	.05½/ .07
P-33	*lb.*	
Thermax	*lb.*	
Velvetex	*lb.*	

Finishes

IVCO lacquer, clear	*gal.*	2.40 / 2.65
colors	*gal.*	2.50 / 4.70
Rubber lacquer, clear	*gal.*	
colored	*gal.*	
Starch, corn, pwd.	100 *lbs.*	3.68 / 3.88
potato	*lb.*	.04½/ .05½
Talc, dusting	*ton*	20.00 /25.00
Pyrax	*ton*	

Flock

Cotton flock, dark	*lb.*	.10½/ .12
dyed	*lb.*	.50 / .80
white	*lb.*	.14½/ .20
Rayon flock, colored	*lb.*	1.40 / 1.75
white	*lb.*	1.10

Latex Compounding Ingredients

Antox, dispersed	*lb.*	
Aquarex D	*lb.*	
F	*lb.*	
Aresco	*lb.*	.28 / .40
Aresklene	*lb.*	
Casein, domestic, ground, 20-30 mesh	*lb.*	$0.12¼/$0.12½
Catalpo	*ton*	
Color pastes, dispersed	*lb.*	
Dispersaid	*lb.*	1.50
Emo, brown	*lb.*	.13
white	*lb.*	.13
Factice Compound, dispersed	*lb.*	.36
Heliozone, dispersed	*lb.*	
Igepon A	*lb.*	
Nekal BX (dry)	*lb.*	
Palmol	*lb.*	.10
Sulphur, colloidal	*lb.*	
Vulcan colors	*lb.*	
Zinc oxide, colloidal	*lb.*	

Mineral Rubber

B. R. C. No. 20	*lb.*	.0125/ .014
Black Diamond, c.l.	*ton*	25.00
Genasco Hydrocarbon, granulated, (fact'y)	*ton*	
solid	*ton*	
Gilsonite Hydrocarbon (factory)	*ton*	
Hydrocarbon, hard	*ton*	
soft	*ton*	
Parmr Grade 1	*ton*	25.00 /28.00
Grade 2	*ton*	25.00 /28.00
265°	*ton*	

Mold Lubricants

Mold Paste No. 1	*lb.*	
Rusco mold paste	*lb.*	.12 / .30
Sericite	*ton*	65.00 /70.00
Soapbark (cut)	*lb.*	.10 / .11
Soapstone	*ton*	15.00 /25.00

Oils

Castor, blown, c.l., drums, returnable	*lb.*	.11½

Reclaiming Oils

B. R. V.	*lb.*	.039 / .041
S. R. O.	*lb.*	.012 / .014

Reenforcers

Carbon Black		
Aerfloted Arrow Specification Black	*lb.*	.0535/ .0825
Arrow Compact Black	*lb.*	
Granulized Carbon Black	*lb.*	
Century (delivered)	*lb.*	.0445/ .0535
"Certified" Cabot	*lb.*	
Spheron	*lb.*	
Disperso (delivered)	*lb.*	.0445/ .0535
Dixie, c.l., f.o.b. New Orleans, La., Galveston or Houston, Tex.	*lb.*	.0445
c.l., delivered New York	*lb.*	.0535
local stock, delivered	*lb.*	.07 / .08¼
Dixiedensed, c.l. f.o.b. New Orleans, La., Galveston or Houston, Tex.	*lb.*	.0445
c.l., delivered New York	*lb.*	.0535
local stock, delivered	*lb.*	.07 / .08¼
Excello, c.l., f.o.b. Gulf ports	*lb.*	.0445
delivered New York	*lb.*	.0535
l.c.l., delivered New York	*lb.*	.07 / .08¼
Gastex	*lb.*	.03 / .07
Kosmobile, c.l., f.o.b. New Orleans, La., Galveston or Houston, Tex.	*lb.*	.0445
c.l., delivered New York	*lb.*	.0535
local stock, delivered	*lb.*	.07 / .08¼
Kosmos, c.l., f.o.b. New Orleans, La., Galveston or Houston, Tex.	*lb.*	.0445
c.l., delivered New York	*lb.*	.0535
local stock, delivered	*lb.*	.07 / .08¼
Micronex Beads	*lb.*	
Mark II	*lb.*	
Standard	*lb.*	
W-5	*lb.*	
W-6	*lb.*	
Ordinary (compressed or uncompressed)	*lb.*	.0535
Supreme, c.l., f.o.b Gulf ports	*lb.*	.0445
delivered New York	*lb.*	.0535
l.c.l., delivered New York	*lb.*	.07 / .08¼
Carbonex	*lb.*	.030 / .0375
Carbonex "S"	*lb.*	.0315/ .040
Clays		
Aerfloted Paragon	*ton*	8.50
Suprex No. 1 Selected	*ton*	10.00
No. 2 Standard	*ton*	8.50
Blue Ridge, dark	*ton*	
China	*ton*	
Dixie	*ton*	
Junior	*ton*	
McNamee	*ton*	
Par	*ton*	
Perfection	*ton*	
Standard	*ton*	
Witco	*ton*	$8.50
Cumar EX	*lb.*	.04

Reodorants

Amora A	*lb.*	
B	*lb.*	
C	*lb.*	
D	*lb.*	
Para-Dors	*lb.*	
Rodo No. 0	*lb.*	
No. 10	*lb.*	

Rubber Substitutes or Factice

Amberex	*lb.*	.13¾
Black	*lb.*	.07 /$0.11
Brown	*lb.*	.075 / .12
Duphax A	*lb.*	.095
B	*lb.*	.095
Fac-Cel B	*lb.*	.12
C	*lb.*	.12
White	*lb.*	.08 / .12

Softeners

B. R. C. No. 555	*lb.*	.012 / .014
B. R. T. No. 7	*lb.*	.015 / .017
Burgundy pitch	*lb.*	.04 / .05
(net weight)	*lb.*	.07 / .08½
Corn oil, crude (bbls.)	*lb.*	.12
Cycline oil	*gal.*	.15 / .28
Genasco liquid asphalt	*gal.*	
Palm oil (Witco)	*lb.*	.06
Petrolatum, light amber	*lb.*	.03¾
Pigmentar (drums)	*gal.*	.25 / .27
Pigmentaroil (drums)	*gal.*	.25 / .27
Pine oil, dest. distilled (drums)	*gal.*	.44 / .48
pitch	*bbl.*	6.00
tar (drums)	*gal.*	.25 / .27
Plastogen	*lb.*	
Reogen	*lb.*	
Rosin oil, compounded	*gal.*	.37 / .41
Rubtack	*lb.*	.10
Tackol	*lb.*	.085 / .18
Tonox	*lb.*	
Powder	*lb.*	
Witco No. 20	*gal.*	.15

Softeners for Hard Rubber Compounding

RSL Resin	*lb.*	
Resin C-55°	*lb.*	.0125/ .0145
Resin C-70°	*lb.*	.0125/ .0145
Resin C-85°	*lb.*	.0125/ .0145

Solvents

Benzol 90% (drums)	*gal.*	.20
Beta-Trichlorethane	*gal.*	
Bondogen	*gal.*	
Carbon bisulphide (drums)	*lb.*	.05¼/ .08½
tetrachloride	*lb.*	.05¼
Dipentene, commercial (drums)	*gal.*	.42 / .44
Rubber (Group 3, refinery)	*gal.*	.06⅞
Solvesso No. 1, tank cars	*gal.*	.17½
No. 2	*gal.*	.22½
No. 3	*gal.*	.17½
No. 4	*gal.*	.22½
Turpentine, wood, dest. distilled (drums)	*gal.*	.41 / .43

Stabilizers for Cure

Laurex, ton lots	*lb.*	
Stearex B	*lb.*	.11 / .13
Beads	*lb.*	.09 / .11
Stearic acid, dbl. pres'd	*lb.*	.12 / .14
single pressed	*lb.*	.11 / .13
Stearite	*lb.*	.08
Zinc stearate	*lb.*	.22 / .25

Synthetic Rubber

DuPrene Latex Type 50	*gal.*	
Type D	*lb.*	

Tackifier

B. R. H. No. 2	*lb.*	.015 / .017

Varnish

Shoe	*gal.*	1.45

Vulcanizing Ingredients

Sulphur		
Chloride, drums	*lb.*	.03½/ .04
Flowers, extrafine refined, U.S.P.	100 *lbs.*	
Rubber	100 *lbs.*	1.95 / 2.70
Telloy	*lb.*	
Vandex	*lb.*	

(See also Colors—Antimony)

Waxes

Carnauba, No. 3 chalky	*lb.*	.31
2 N.C.	*lb.*	.33
3 N.C.	*lb.*	.32
1 Yellow	*lb.*	.41
2	*lb.*	.40
Montan, crude	*lb.*	.11

IMPORTS, CONSUMPTION, AND STOCKS

CRUDE rubber consumption by United States manufacturers for March totaled 42,620 long tons, compared with 43,187 long tons for February, a decrease of 1.3% under February, 1935, and 9.5% below March, 1934, according to R.M.A. statistics. Consumption for March, 1934, was 47,097 long tons.

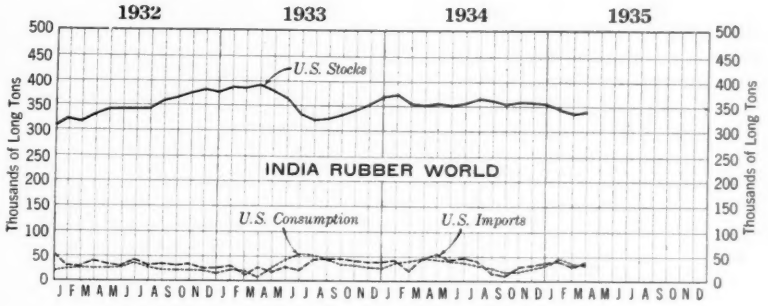
Crude rubber imports for March were 44,041 long tons, an increase of 24.5% over the February figure of 35,383 long tons, but 1.3% under the 44,605 long tons imported in March, 1934.

The estimated total domestic stocks of crude rubber on hand March 31 were 338,700 long tons, against February 28 stocks of 337,332 long tons and 352,897 long tons on hand March 31, 1934.

Crude rubber afloat for United States ports March 31 was 44,485 long tons, compared with 42,969 long tons afloat February 28 and 54,722 long tons afloat March 31, 1934.

London and Liverpool Stocks

Week Ended	Tons London	Tons Liverpool
Mar. 30	92,602	69,322
Apr. 6	93,209	70,151
Apr. 13	94,130	70,057
Apr. 20	94,361	70,886


1932
1933
1934
1935
U.S. Stocks
INDIA RUBBER WORLD
U.S. Consumption
U.S. Imports
Thousands of Long Tons
Thousands of Long Tons
J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D

United States Stocks, Imports, and Consumption

United States and World Statistics of Rubber Imports, Exports, Consumption, and Stocks

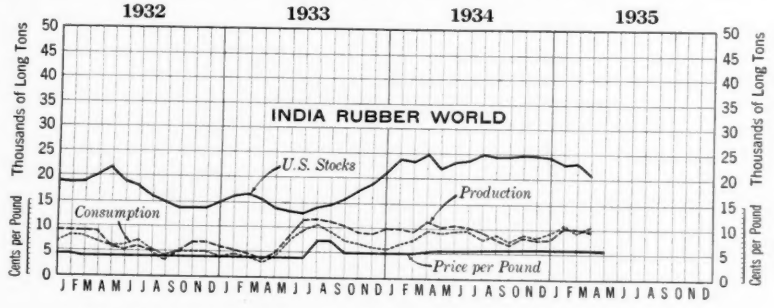
Twelve Months	U. S. Net Imports* Tons	U. S. Consumption Tons	U. S. Stocks Mfgrs., Importers, Dealers, Etc.† Tons	U. S. Stocks Afloat† Tons	U. K.— Public Warehouses, London, Liverpool†‡ Tons	Singapore and Penang Dealers and Port Stocks†‡ Tons	World Production (Net Exports)‡ Tons	World Consumption * Estimated‡ Tons	World Stocks†‡§ Tons
1931	495,163	348,986	322,000	40,455	127,149	49,570	799,800	812,500	589,295
1932	400,787	332,000	379,000	38,360	92,674	30,927	708,700	709,600	589,153
1933	411,615	401,000	365,000	55,606	86,505	44,884	850,100	797,100	616,370
1934	469,484	454,350	352,632	47,644	134,927	62,142	1,014,921	952,596	676,994
1935									
January ..	42,059	47,103	346,084	42,066	148,337	59,609	78,463	88,529	669,030
February .	35,383	43,187	337,332	42,969	155,727	57,586	75,957	.....	657,740
March ...	44,041	42,620	338,700	44,485	.....	.....	.....	.....	.....

*Including liquid latex. †Stocks on hand the last of the month or year. ‡Statistical Bulletin of the International Rubber Regulation Committee. §Stocks at U. S. A., U. K., Singapore and Penang, Para, Manaos and afloat.

RECLAIMED RUBBER

THE reclaim demand is improving as shown by the current statistics of consumption, and reclaimers view the outlook with considerable optimism for the next quarter at least. This view is in agreement with general conviction that business in a short time will regain normal proportions. The various rubber manufacturing divisions are all producing in good volume, with distinct tendency to increase output in the second quarter.

Prices on all grades of reclaim are quoted unchanged from last month.


1932
1933
1934
1935
INDIA RUBBER WORLD
U.S. Stocks
Production
Consumption
Price per Pound
Thousands of Long Tons
Cents per Pound
Thousands of Long Tons
Cents per Pound
J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D

Production, Consumption, Stocks, and Price of Tire Reclaim

United States Reclaimed Rubber Statistics—Long Tons

Year	Production	Consumption	Consumption Per Cent to Crude	United States Stocks*	Exports
1931	132,462	125,001	35.7	19,257	6,971
1932	75,656	77,500	23.3	21,714	3,536
1933	99,974	81,612	20.1	20,746	3,583
1934	110,010	100,597	22.3	23,079	4,737
1935					
January	10,465	11,261	23.9	22,291	517
February	10,072	9,374	21.7	22,989	532
March	9,741	10,549	24.8	20,637	....

*Stocks on hand the last of the month or year.
Compiled by The Rubber Manufacturers Association, Inc.

New York Quotations

April 26, 1935

	Spec. Grav.	Cents per lb.
High Tensile		
Super-reclaim, black.....	1.20	8¾/9
red	1.20	7 /7¼
Auto Tire		
Black	1.21	5 /5¼
Black selected tires.....	1.18	5¼/5½
Dark gray	1.35	6¼/6½
White	1.40	9¼/9½
Shoe		
Unwashed	1.60	6½/6¾
Washed	1.50	8 /9
Tube		
No. 1	1.00	13 /
No. 2	1.10	7½/7¾
Truck Tire		
Truck tire, heavy gravity.	1.55	5½/6
Truck tire, light gravity..	1.40	6 /6¼
Miscellaneous		
Mechanical blends	1.60	4¼/4½

1934 American Guayule Production

The Intercontinental Rubber Co. states that, as a result of guayule shrub harvesting last year by American farmers in the vicinity of Salinas on marginal lands not well adapted to other crops, they produced in their extraction plant operated by a subsidiary (American Rubber Producers, Inc.) at Salinas, Calif., 1,254,600 pounds of dry Calpar guayule rubber. All of this was sold to domestic rubber manufacturers with the exception of 56,000 pounds shipped to Canada.

COTTON AND FABRICS

NEW YORK COTTON EXCHANGE WEEK-END CLOSING PRICES

Futures	Mar. 2	Mar. 30	Apr. 6	Apr. 13	Apr. 20
Apr.	12.39	10.98	10.92	11.63	11.51
May	.....	11.03	10.99	11.67	11.55
July	12.52	11.10	11.05	11.75	11.65
Sept.	12.49	10.73	10.80	11.44	11.42
Dec.	12.54	10.62	10.74	11.49	11.38
Mar.	.....	10.69	10.83	11.59	11.51

THE above table gives the nearest first and last week-end closing prices of the month previous to that under review, also the week-end closing prices of each week of this review. This plan permits tracing at a glance the prices of representative futures for approximately two consecutive months.

Week ended March 30. Mill and professional buying with resulting short covering started the week with an advance of 12 to 20 points, followed by a reaction due to the House of Representatives rejecting the silver amendment to the relief bill March 27, and again by Secretary of Agriculture H. A. Wallace's statement that there was "more possibility of an increase in the processing tax than otherwise." The half-season consumption of American cotton is reported to be the lowest since the 1930-31 season and that of foreign cotton the highest of record. A feature of the week was the interest shown in July contracts, the last of the controlled crop, as contrasted with October contracts, the first of the new crop. The price differential widened to 50 points out of the possibility of a scarcity should the Government impound 6,000,000 pool cotton. The week ended with a steady tone and prices the same on new crop contracts to 17 points higher on old crop contracts than in the previous week.

Week ended April 6. Growing opposition to the so-called demoralizing processing tax and the apparent disposition of the A.A.A. against making definite commitments as to new crop loan plans occasioned a dull and uneventful week in trading circles. Reports that new crop contracts were oversold led to a reversal of activity in them as compared with near months, thus narrowing the differential again to normal and closing the week with gains in distant months of 14 points and losses in near months of 7 points.

Week ended April 13. Starting with a strong tone cotton trading and prices rose steadily during the week to register 69 to 76 points advance to the highest prices that have been reached since the 187-point break of March 11. Activity in Washington, which was secret, resulted in various rumors of an optimistic nature. It was felt that pressure being brought on the Administration by textile manufacturers and southern senators would bring about an early announcement of the 1935 crop loan policy, the removal of the processing tax, and plans for the cotton industry to benefit from the Public Works fund. Other favorable influences were increased export shipments, inflation of silver, and the extent to which cotton farmers are restricting acreage to 35% by accepting rent from the Government up to that amount rather than the required 25%.

Week ended April 20. Rumors that Washington might set a 10¢ loan value on the 1935 crop and reports of increasing shutdowns of mills because of the process tax started the dull pre-holiday period, which was characterized with small volume and slightly reactionary prices. This trend continued except for an upturn of 10 to 12 points April 18 as traders adjusted their holdings for the holiday. The period closed April 18 with net losses of 2 to 12 points. President Roosevelt called members of the Cabinet Committee as consultants on the cotton situation. Secretaries Roper, Wallace, Perkins, and Hull ordered their staffs to collect all facts bearing on the industry's ills to be used in the committee's first meeting April 22.

An erratic market prevailed April 22 which caused price fluctuations from early 5- to 7-point gain through losses of 16 points to closing losses of only 3 to 7 points as against the previous close. Inflation, rains in the South, and the uncertainty of Washington's policy in the tangled cotton and textile situation caused alternating optimism and disappointment. Dullness and lack of news characterized the two days following, with slight recessions bringing the price of July to 11.52¢ and October to 11.18¢ as compared with the previous close of 11.59 and 11.27 respectively.

Cotton Fabrics

DUCKS, DRILLS, AND OSNABURGS. The tone of the market has improved considerably during the past two to three weeks. There has been a sharper demand for merchandise of a seasonal nature for quick shipment. The aggregate of such inquiries is of substantial volume, and the amount that is cleared each day tends to improve markedly the mill inventory position of stocks for spring and summer consumption.

Prices are improving slowly, pending a certainty of sustained or accelerated volume of sales. Cotton goods manufacturers have to consider raw material advances against a month ago of virtually $5 a bale, which has not been reflected in full as yet in the improved prices of mill products. The outlook is for four or five weeks of livelier trading, with fabric prices improving.

RAINCOAT FABRICS. Spring raincoats sold very well during April. The most popular for women's wear is an all-cotton printed polka-dot in five different colors.

SHEETINGS. Coincident with the advance in raw cotton the grey cloth market was very active for about ten days, with prices advancing in the light yarn group by as much as 5 to 8¢ per yard, and in the heavy yarn group by ¼¢ per yard on the average. The long overdue buying materially improved and strengthened the grey cloth situation compared with that previously prevailing since the latter part of February.

TIRE FABRICS. Demand is moderate and seasonal; while prices continue steady and unchanged.

WEEKLY AVERAGE PRICES OF MIDDLING COTTON

Week Ended	Cents per Pound
Mar. 30	11.33
Apr. 6	11.24
Apr. 13	11.68
Apr. 20	11.89

New York Quotations

April 26, 1935

Drills		
38-inch 2.00-yard	yd.	$0.15¼
40-inch 3.47-yard		.09¼
50-inch 1.52-yard		.21¾
52-inch 1.85-yard		.17⅞
52-inch 1.90-yard		.15⅝
52-inch 2.20-yard		.14⅜
52-inch 2.50-yard		.12⅝
59-inch 1.85-yard		.16
Ducks		
38-inch 2.00-yard D. F.	yd.	.15 /.15½
40-inch 1.45-yard S. F.		.21⅜
51½-inch 1.35-yard D. F.		.21½
72-inch 1.05-yard D. F.		.28½/.29⅝
72-inch 17.21-ounce		.34¼
MECHANICALS		
Hose and belting	lb.	.34
TENNIS		
52-inch 1.35-yard	yd.	.23
***Hollands**		
GOLD SEAL		
30-inch No. 72	yd.	.19
40-inch No. 72		.20
RED SEAL		
30-inch	yd.	.16½
40-inch		.17½
50-inch		.23
Osnaburgs		
40-inch 2.34-yard	yd.	.12 /.13⅛
40-inch 2.48-yard		.11⅜
40-inch 2.56-yard		.11
40-inch 3.00-yard		.10⅜
40-inch 7-ounce part waste		.11
40-inch 10-ounce part waste		.16¼
37-inch 2.42-yard		.12⅞
Raincoat Fabrics		
COTTON		
Bombazine 60 x 64	yd.	.09
Plaids 60 x 48		.11½
Surface prints 60 x 64		.12¾
Print cloth, 38½-inch, 60 x 64		.06⅝
SHEETINGS, 40-INCH		
48 x 48, 2.50-yard	yd.	.10⅝
64 x 68, 3.15-yard		.09⅝
56 x 60, 3.60-yard		.08⅜
44 x 48, 3.75-yard		.06⅝
SHEETINGS, 36-INCH		
48 x 48, 5.00-yard	yd.	.05¾
44 x 40, 6.15-yard		.04⅞
Tire Fabrics		
BUILDER		
17¼ ounce 60" 23/11 ply Karded peeler	lb.	.37
CHAFER		
14 ounce 60" 20/8 ply Karded peeler	lb.	.37
9¼ ounce 60" 10/2 ply Karded peeler	lb.	.37
CORD FABRICS		
23/5/3 Karded peeler, 1 1/16" cotton	lb.	.37
15/3/3 Karded peeler, 1 1/16" cotton	lb.	.35
23/5/3 Karded peeler, 1¼" cotton	lb.	.44
23/5/3 Combed Egyptian	lb.	.51
LENO BREAKER		
8¼ ounce and 10¼ ounce 60" Karded peeler	lb.	.32

*For less than 1,000 yards of a width add 10% to given prices.

The Wellman Company

Manufacturers of

THE PATTEN SOLE CUTTING MACHINE

FOR CUTTING SOLES AND TAPS FROM SHEET STOCK AT ANY BEVEL FROM 27° TO 90°.

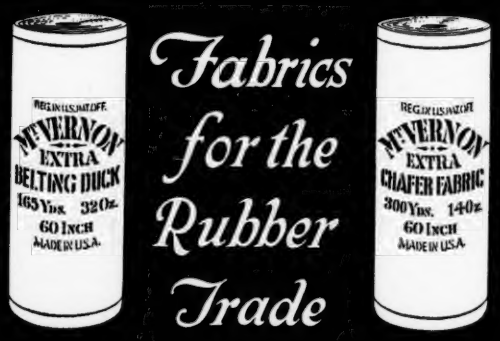
THESE MACHINES HAVE A CAPACITY MANY TIMES IN EXCESS OF HAND CUTTING. MANUFACTURED OF THE BEST MATERIALS AND WORKMANSHIP BUT LITTLE ATTENTION IS NECESSARY TO KEEP THEM IN SERVICEABLE CONDITION. THE SOLES CUT ARE OF SUCH STANDARD BEVEL AS MAY BE DESIRED AND POSSESS A SMOOTH AND ATTRACTIVE EDGE ADDING MUCH TO THE APPEARANCE OF THE FINISHED SHOE.

Wellman Company

Manufacturers of Rubber Sole Cutting Machinery

MEDFORD, MASS.

MT. VERNON WOODBERRY MILLS, INC.



TURNER, HALSEY CO.

SALES AGENT

40 WORTH ST., NEW YORK

BALTIMORE BOSTON — BRANCHES CHICAGO NEW ORLEANS — SAN FRANCISCO ST. LOUIS

Regular and Special Constructions

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COTTON FABRICS

Single Filling Double Filling

and

ARMY

Ducks

HOSE and BELTING

Ducks

Drills

Selected

Osnaburgs

Curran & Barry

320 BROADWAY

NEW YORK

Editor's Book Table

NEW PUBLICATIONS

"Velvetex. Inert Carbon Filler. Bulletin No. 82." Binney & Smith Co., 41 E. 42nd St., New York, N. Y. This two-page bulletin on the inert carbon filler Velvetex describes its nature, recommended applications, and functions in rubber compounding methods of use. Its distinctive carbon content, volatile, and acetone extractive matter are reported in an analysis in this bulletin.

"Zenite, Zenite A and Zenite B. Laboratory Report No. 190." E. I. du Pont de Nemours & Co., Inc., Rubber Chemicals Division, Wilmington, Del. The three Zenite accelerators are described in detail as regards composition, comparative activity, and physical tests of gum stocks containing them. Tests of Zenite with several secondary accelerators are also compared.

"Spray Painting and Finishing Equipment. Bulletin AD114." Binks Mfg. Co., 3114 Carroll Ave., Chicago, Ill. This publication describes in detail and illustrates the extensive line of distinctive spray painting equipment made by this concern, including hand and power spray units for wet and dry applications. Helpful suggestions and technical information on the proper equipment for various users are to be found in this bulletin.

"Metallic Zinc Powder in Industrial Paint." The New Jersey Zinc Co., 160 Front St., New York, N. Y. The tested advantages of metallic zinc powder in industrial paint are described and pictured in this booklet. For priming and finishing iron and steel, both structural and machine, for galvanized metal and sheet zinc, and for other important, but less common uses such paints are giving performance of high efficiency due to their superior adhesive ability and single coat hiding over a background of any color.

"Tireside Chats. Number Two." The Fisk Tire Co., Inc., Chicopee Falls, Mass. This booklet presents an analysis of tire merchandising outlets illustrated by a series of five charts comparing the unit and percentage sales of tire sales from 1922 to 1933 inclusive. This study includes distribution by mail order catalog, mail order stores, tire company owned and controlled stores and direct factory shipment, oil companies, and independent tire dealers. The final chart shows the dominant position occupied by the independent tire dealers in comparison with total sales of the industry and justifies the conclusion that their position is not endangered.

"Rubber Cutting Machines." Wm. R. Thropp & Sons Co., Trenton, N. J. In this illustrated bulletin the latest-model motor-driven rubber cutting machines are described in detailed specifications. The machines included are the automatic washer cutter, mold-blank cutter, circular knife grinder, and band cutter.

"Certified Service Plan for Selling Goodrich Batteries." The B. F. Goodrich Co., Akron, O. This loose-leaf bulletin of ten pages illustrates and fully describes a new line of specially designed battery chargers, merchandiser and display testing racks for batteries; also service kits and accessories.

"Railway and Highway Transportation Abroad." W. Rodney Long, Transportation Division, United States Department of Commerce, Bureau of Foreign and Domestic Commerce, Washington, D. C. This book is a study of the policies of foreign countries directed toward the coordination of highway and railway transport services as well as those measures introduced by railways to meet competition from other forms of transport. This report is the first of three comprising an investigation into the existing competition between highway and railway services abroad.

BOOK REVIEW

"The Oil Palm in Malaya." By B. Bunting, C. D. V. Georgi, and J. N. Milsum. Malayan Planting Manual No. 1. Published by the Department of Agriculture, Straits Settlements and Federated Malay States, Kuala Lumpur, 1934. Cloth, 306 pages, 36 illustrations, 2 graphs, 4 plans, 31 tables. Bibliography. Appendix. Index.

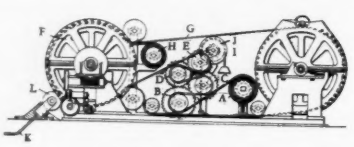
This interesting study was originated in 1927 as special bulletin No. 39 issued by the Malay department of agriculture. So great was the demand for this work that the supply soon was exhausted, and the need of an up-to-date volume grew. The result is the present book released as No. 1 of a new series of Malayan planting manuals to which it is hoped to add other works from time to time.

The authors, respectively, agriculturist, acting agricultural chemist, and senior assistant agriculturist of the department in this book replete with essential data, cover the growing oil palm industry in Malaya, from its early history to the soil and planting requisites, the development and care of the plantation, preparation of palm oil products, factory processes, and finally shipment of the oil to world markets. Of interest to the rubber man is the brief section on interplanting oil palms with rubber.

Continuous Vulcanizing Machine

AMONG the advantages of the machine shown in the illustration[1] is its capacity for the production of special vulcanized articles, such as belting, which formerly could not be manufactured by continuous process methods. Referring to the illustration, the rubber belting or other product to be vulcanized is fed from a let-off reel *A* around the tensioning rolls *B*, *C*, *D*, and *E* and then between the surface of the heated drum *F* and the metal tension band *G* and is vulcanized under the periphery of the drum. After leaving the drum, the belting is wound upon a reel *H*.

The machine is equipped with mechanism by which an initial tension may be imparted to the belting as it is delivered to the drum. This mechanism is generally indicated by the reference character *I* and includes the tensioning rolls *B*, *C*, *D*, and *E*, which are geared together and retarded in their rotation as a unit by the friction sheave *J*.



Belt Vulcanizer

The movement of the let-off reel is retarded by a brake. With this arrangement the relatively low tension under which the belting leaves the let-off reel and which is necessary for satisfactory operation of the let-off control may be built up to the required high vulcanizing tension at the point where the belting contacts with the vulcanizing drum.

In the operation of the apparatus the belting is heavily compressed by hydraulic power supplied through connection *K* and applied by the compression roll *L*. During the remainder of the travel of the belting around the steam heated vulcanizing drum it is maintained in predetermined pressure by a moderate tension in the tension band.

[1] U. S. patent No. 1,987,890, Jan. 15, 1935.

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ALL CLASSIFIED ADVERTISING MUST BE PAID IN ADVANCE

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Allow nine words for keyed address. *Replies forwarded without charge.*

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SUPERINTENDENT OR ASSISTANT OF BROAD AND DIVERSIfied experience desires to connect with small progressive company. Thoroughly familiar with all lines of mechanical goods, sponge rubber, soles and heels, rubber covered rolls, sundries, hard rubber, specialties, automotive parts, flooring, and offset blankets. Thoroughly familiar with calenders, mills, presses, and spreaders. Competent to organize new plant and train organization. Address Box No. 495, care of INDIA RUBBER WORLD.

TIRE DESIGN AND CONSTRUCTION ENGINEER, LONG EXPERIence, familiar with all types of drum and core building both truck and passenger. Field experience as well as factory. Capable of handling production, time study, factory planning as well as tire development on a quality and economical basis. Record of accomplishment. Present employed but good reasons for change. Address Box No. 498, care of INDIA RUBBER WORLD.

GENERAL FOREMAN MILL, CALENDER, AND PRESS DEPARTments, desires to make a change. Twelve years' practical experience in rubber footwear, tire, and heel and sole production. Address Box No. 499, care of INDIA RUBBER WORLD.

CHEMIST: WITH DESIRE FOR TECHNICAL SALES position. Four years' experience control and compounding of proofing, mechanicals, and cements. 26, single, locate anywhere. At present employed, but available on notice. Address Box No. 500, care of INDIA RUBBER WORLD.

SITUATIONS WANTED—Continued

FACTORY MANAGER OR SUPERINTENDENT: TEN years' experience, principally mechanicals and dipped goods, would like to make connection with progressive company. College trained. Employed. Address Box No. 501, care of INDIA RUBBER WORLD.

ASSISTANT SUPERINTENDENT OR GENERAL FOREMAN: EXperienced in both soft and hard rubber mechanicals, calenders, mills, and presses. Knowledge of compounding. Reputed excellent handler of men. Address Box No. 505, care of INDIA RUBBER WORLD.

SITUATIONS OPEN

WANTED: EXPERIENCED SUPERVISOR MANUFACTURING all V-types fan, fractional horsepower, multiple drive belts. Necessary acquaintanceship machinery; also compounds. Requires up-to-date knowledge of data and machinery. Large manufacturer; excellent opportunity right man. Address Box No. 494, care of INDIA RUBBER WORLD.

WANTED FOR SWITZERLAND: ASSISTANT PRODUCTION manager fully conversant with the manufacture of rubber articles. Apply by letter to Box No. 502, care of INDIA RUBBER WORLD.

MAN, THOROUGHLY FAMILIAR WITH DIPPING AND GENERAL manufacture of latex for bathing caps, baby pants, gloves, etc., to start new department in well-established rubber factory which has never done any dipping. State former connections, experience, etc. All communications strictly confidential. Address Box No. 504, care of INDIA RUBBER WORLD.

WANTED: HIGH-GRADE SALESMEN FOR MERCHANICAL RUBber goods. Also for packings and lathe cut molded goods. Address Box No. 506, care of INDIA RUBBER WORLD.

PROFESSIONAL SERVICES

ENGINEERS • CONSULTANTS • CHEMISTS

PAUL A. FRANK

RUBBER Products—Processes—Machinery

I finance and direct the development and promotion of inventions which relate to the rubber industry.

SECOND NATIONAL BLDG. AKRON, O.

COLIN MACBETH, M.I.A.E.: M.S.A.E.: F.I.R.I.

Rubber Expert and Tire Technician for Product and Plant

Technical introduction of American products to British markets.

67, Norwich Union Chambers, Birmingham, 3, England

1910 A QUARTER CENTURY 1935

of

SERVICE TO THE RUBBER INDUSTRY

Supplying Dependable Equipment

STOCK SHELLS FOR EVERY NEED

Large diameter, light weight, extra strong, seamless.

MANDRELS OF ALL TYPES

Circular and straight, sherardized for inner tubes, hose, jar rings, etc. Supplied in aluminum and steel. Circular mandrels licensed under C. E. Lowe Co. patents.

AIR BAG AND MANDREL POLISHING MACHINERY

Sherardizing Chrome and Cadmium Plating.

The National Sherardizing and Machine Co.

Hartford, Conn. Akron, Ohio

Export Agents

OLIVER BROS., 200 Hudson Street, New York City, N. Y.

NOTE: We have acquired for our Akron Branch, the complete equipment for bending circular mandrels from The Clyde E. Lowe Co. of Cleveland, Ohio.

Wilbow

THE WILLIAMS-BOWMAN RUBBER COMPANY

MANUFACTURERS OF

Molded and Extruded Rubber Goods

Plumbers' Supplies—Gaskets & Washers

Rubber Covered Rolls

Estimates Cheerfully Furnished

OFFICE & FACTORY: 1941-51 SO. 54th AVE. CICERO, ILLINOIS

GUARANTEED REBUILT MACHINERY

IMMEDIATE DELIVERIES FROM STOCK

MILLS, CALENDERS, TUBERS, HYDRAULIC PRESSES, PUMPS, VULCANIZERS, TIRE MAKING EQUIPMENT, MOULDS, ETC.

UNITED RUBBER MACHINERY EXCHANGE

319-323 FRELINGHUYSEN AVE., Cable Address "Urme" NEWARK, N. J.

(*Advertisements continued on page* 81)

RUBBER SCRAP

THE rubber scrap market for April held quiet but steady owing to ample stocks of reclaim.

BOOTS AND SHOES. Demand is good for these grades, with collections slow.

INNER TUBES. An excellent demand for all grades of tubes was evident during April, both for domestic use and export.

TIRES. Prices are low, and in view of this fact collections will be poor for some time.

SOLID TIRES. Clean mixed and light gravity tires are in good demand. Stocks are scanty, and prices firm.

MECHANICALS. All grades are moving steadily into consumption occasioned apparently by the need of the automobile industry for rubber accessories, most of which contain considerable medium-grade reclaim. All grades of mechanical scrap are quoted unchanged from last month.

HARD RUBBER. Hard rubber scrap is scarce, and prices firm and unchanged from a month ago.

CONSUMERS' BUYING PRICES

(Carload Lots Delivered Eastern Mills)

April 26, 1935

		Prices
Boots and Shoes		
Boots and shoes, black	lb.	$0.01⅛/$0.01¼
Colored	lb.	.00¾/ .00⅞
Untrimmed arctics	lb.	.00¾/ .00⅞
Inner Tubes		
No. 1, floating	lb.	.07 / .07¼
No. 2, compound	lb.	.03¾/ .03½
Red	lb.	.02½/ .02⅝
Mixed tubes	lb.	.02¾/ .03
Tires (Akron District)		
Pneumatic Standard		
Mixed auto tires with beads	ton	8.75 / 9.00
Beadless	ton	15.50 /16.00
Auto tire carcass	ton	10.00 /10.50
Black auto peelings	ton	18.50 /19.50
Solid		
Clean mixed truck	ton	38.50 /40.00
Light gravity	ton	42.00 /43.00
Mechanicals		
Mixed black scrap	ton	15.00 /17.00
Hose, air brake	ton	14.00 /15.00
Garden, rubber covered	ton	13.00 /13.50
Steam and water, soft	ton	13.00 /13.50
No. 1 red	lb.	.02¼/ .02⅜
No. 2 red	lb.	.01½/ .01¾
White druggists' sundries	lb.	.02¾/ .03
Mechanical	lb.	.02 / .02½
Hard Rubber		
No. 1 hard rubber	lb.	.11⅛/ .11½

TRADE MARKS

United States

(*Concluded from page 72*)

322,398. Representation of a knight's profile. Prophylactic rubber articles. Youngs Rubber Corp., Inc., New York, N. Y.

322,399. Label containing representation of a knight's profile, and the words: **"Improved Trojans."** Prophylactic rubber articles. Youngs Rubber Corp., Inc., New York, N. Y.

322,435. **"88."** Tires. Fisk Rubber Corp., Chicopee Falls, Mass.

322,436. **Spongex.** Chair and automobile seat cushions, cushion fillers, and bath pillows. Sponge Rubber Products Co., Derby, Conn.

322,443. **Coach.** Athletic supporters. Johnson & Johnson, New Brunswick, N. J.

322,635. **Ebonite.** Brake lining. L. J. Miley Co., Chicago, Ill.

322,637. **Ultrablak.** Carbon black. Binney & Smith Co., New York, N. Y.

322,650. **Evenflo.** Nipples, nipple-retaining caps, and nursing bottles. Pyramid Rubber Co., Ravenna, O.

322,815. Seal containing the letters: **"SR."** Adhesive and masking tape. Seamless Rubber Co., Inc., New Haven, Conn.

322,816. Seal containing the letters: **"SR."** Surgical and druggists' sundries. Seamless Rubber Co., Inc., New Haven, Conn.

MIDWEST

(*Continued from page 59*)

The Monarch Rubber Co., Lumber Exchange, Minneapolis, Minn., has been appointed local jobber for the industrial rubber products of the Hewitt Rubber Corp., Buffalo, N. Y. Monarch executives include W. I. Fleck, president and treasurer; H. V. Fleck, vice president and secretary; and O. L. Hibbard, sales manager. L. B. Armstrong, 2406 W. Clybourn St., Milwaukee, Wis., is the district representative for Hewitt.

Ahlbell General Manager

John L. Hunter, secretary-treasurer and general manager of the Ahlbell Battery Container Corp., Waukegan, Ill., since 1927, first saw the light of day in Dunfermline, Scotland, January 18, 1894. He was educated in his native land.

Coming to America, he found employment as assistant chemist at the United States Rubber Co. plant in New Brunswick, N. J., in 1921. The following year, however, he was sent to the Providence, R. I., factory, where he served as chemist. Next, from 1923 to 1926, he acted as superintendent of the Ahlbell Battery Container Corp. Then during 1926-1927 he was chemist for the Rub-Tex Products Co., Indianapolis, Ind., before returning to Ahlbell to take his present positions. Mr. Hunter has also invented and designed presses for manufacturing storage battery containers.

John L. Hunter

His outside activities are diversified. He belongs to the American Legion, being past commander of Post 88, N. J., to the Masons, Elks, chamber of commerce, Y.M.C.A., and Rotary and Glen Flora Country clubs. He is, furthermore, a director of the Y., and the Rotary Club, present president of the chamber of commerce, as well as a member of the code authority of the hard rubber division of the rubber manufacturing industry and has represented industry on his local NRA board.

Fire Hose Inquiry

The Federal Trade Commission filed a formal complaint April 6 against two NRA Rubber Code Authorities and seventeen major rubber concerns, charging conspiracy to violate the anti-trust laws and NRA codes and to fix prices in the sale of rubber and fire hose to New York and other large cities.

It is asserted that the cost of fire hose rose from 23 to 34¢ a foot in October, 1932, to more than 78¢ a foot in 1934. The increase is attributed mainly to the Code Authority established under the NRA. New York, Milwaukee, and other cities complain that when they advertise, they receive identical bids from the fire hose manufacturers. On February 11 of this year, for example, New York received thirteen bids, all quoting 82¢ a foot.

Hexacord, New Lamp Cord

Simplex Wire & Cable Co., 79 Sidney St., Cambridge A, Boston, Mass., announces Hexacord, a new, twin parallel, rubber sheathed lamp cord suitable for electric lamps, clocks, fans, and similar electrical appliances. It is made in four colors: brown, black, green, and ivory; in sizes No. 18 and No. 16 and two-conductor only. Outside diameters of No. 18 are 0.130-inch by 0.250-inch. Each insulated conductor is hexagonal in shape. The two are securely joined together, but may be separated easily, leaving each with its complete insulation. Hexacord is approved by the National Board of Fire Underwriters as type PO-SJ and carries their bracelet labels.

N. W. Pickering, president of Farrel-Birmingham Co., Inc., Ansonia, Conn., and Buffalo, N. Y., sailed on the *Britannic* on April 8 for a two months' trip which will take him to a number of countries of Europe. The trip is one combining business with vacation, and Mr. Pickering will spend some time with the company's representatives in England, France, Sweden, and Norway. He also will visit Germany and Italy. Mrs. Pickering accompanied her husband to England, where she will visit with relatives. They expect to return home late in June.

ERNEST JACOBY & CO.

Crude Rubber
Liquid Latex
Carbon Black
Clay

Stocks of above carried at all times

BOSTON MASS.

Cable Address: Jacobite Boston

Announcing from the Orient!
The Only Colloidal Whiting in the World as a Proven Rubber Reenforcer

HAKUENKA

Special Attention to Export Trade
SHIRAISHI KOGYO KAISHA, LTD.
TOKYO and OSAKA, JAPAN

Classified Advertisements

Continued

SITUATIONS OPEN—(Continued)

WANTED: A FULL TIME RUBBER SALESMAN TO SELL RUBber mechanicals for Midwest factory. Salary and commission. Address Box No. 507, care of INDIA RUBBER WORLD.

BUSINESS OPPORTUNITIES

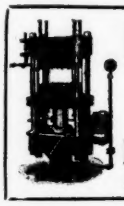
SMALL WELL-EQUIPPED RUBBER PLANT FOR SALE OR lease, easy terms. 2-60″ mills; 66″ calender; 20 hydraulic presses, 20 to 36″. All ready to run. Small community; ideal labor conditions. Cheap power and water. Address Box No. 496, care of INDIA RUBBER WORLD.

FOR SALE: SMALL RUBBER PLANT FOR MOLDED GOODS located near Boston; now in operation. Address Box No. 503, care of INDIA RUBBER WORLD.

MACHINERY AND SUPPLIES FOR SALE

FOR SALE: THREE BIRMINGHAM 72″ MIXING MILLS; FOUR 82″ Mixing Mills; one 2-roll Calender 14 by 14″ belted to motor; one Royle No. 4 Perfection Tuber; one 18 by 54″ Birmingham 4-roll Calender; one unused 18 by 30″ heavy duty FARREL MILL, chain drive; complete line of W. & P. Mixers, Vacuum Shelf Driers, Calenders, Mills, Colloid Mills, Pebble Mills, Dough Mixers, Hydraulic Presses, Pumps, etc. Rebuilt, guaranteed. What machinery have you for sale? CONSOLIDATED PRODUCTS CO., INC., 13-16 Park Row, New York, N. Y.

FOR SALE: 2 ROYLE NO. 4 STRAINERS; 1 ADAMSON 42″ BY 120″ hydraulic press; 2 American Process automatic continuous screw presses; vacuum shelf driers; W & P mixers, etc. ATTRACTIVELY PRICED! Send us a list of your surplus equipment. STEIN-BRILL CORPORATION, 183 Varick Street, New York, N. Y.



PLASTICS MOLDING PRESSES

Plain or Semi-automatic—Any Size or pressure—Pumps, Valves, etc.

Dunning & Boschert Press Co., Inc.
336 W. WATER ST. SYRACUSE, N. Y.

WOOD FLOUR

AN EXCELLENT FILLER

UNIFORM SCREEN ANALYSIS

BECKER, MOORE & CO., INC.
NORTH TONAWANDA, N. Y.

For Flat Stationary or Moving Curved Surfaces

Surface Temperatures
Use the "Alnor" Pyrocon

Ideal for rolls, molds, plates, platens and plastic material temperatures.

Write for bulletin.

ILLINOIS TESTING LABORATORIES, Inc.
424 N. La Salle Street Chicago, Illinois

INTERNATIONAL PULP CO.
41 Park Row, NEW YORK, N. Y.
SOLE PRODUCERS
ASBESTINE
REG. U. S. PAT. OFF.

Headquarters for

RUBBER MILL MACHINERY

L. ALBERT & SON

Trenton, N. J. • Akron, Ohio

SCRAP RUBBER
HARD RUBBER DUST
CRUDE RUBBER

Main Office:
608 Akron Savings & Loan Bldg.
AKRON, OHIO

A. Schulman Inc.

Warehouses in Both Cities

Branch Office:
576 No. 20th Street
EAST ST. LOUIS, ILL.

(*Advertisements continued on page* 83)

Industrial Truck Tires[1]

TABLE 1. PRESSED-ON TYPE
Effective from June 1, 1934

The dimensions given in the following table for width of tires and for actual wheel diameters shall be standard for flat-base tires, pressed-on type:

Width of Tire (in Inches)	Actual Wheel Diameters (in Inches)
2½	6
3	6¼, 20
3½	8, 11¼, 12⅛, 16, 17¾, 20, 23½
4	12⅛, 16
4½	17¾
5	5, 6½, 11¼, 16
6	6¼, 6½, 16
7	6½, 11¾, 16

All tires are to have a molded height of approximately 2 inches, including base band.

All wheel diameters must be "actual" to get proper fit of tires on wheels.

Tolerances on wheel diameters shall be plus 0.005-inch, minus 0.000-inch.

Inside circumference of base band to be determined by deducting from correct wheel circumference for any given wheel diameter, the amount shown in column "C" below:

Actual Diameter of Wheel	"C" (Inch)
5 ins. and above, but less than 10 ins.	0.063
10 ins. and above, but less than 15 ins.	0.078
15 ins. and above, but less than 20 ins.	0.108
20 ins. and above, but less than 24 ins.	0.138
24 ins. and over	0.203

Circumferential tolerance of band, plus or minus 0.025-inch.

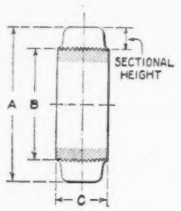
Width of band tolerances, plus 0.000-inch, minus 0.031-inch.

Thickness of flat band 0.437-inch, plus or minus 0.008-inch.

TABLE 2. CURED-ON TYPE

Effective from November 1, 1934

The following contains a simplified list of stock sizes for solid tires of the cured-on type for industrial trailers and trucks. They are not recommended for use on driving wheels.



Size (Inches)	A O. D. (Ins.)	C Width (Ins.)	Section Height (In.)	B Wheel O. D. (Ins.)
3 by 1½	3.0	1.5	0.625	1.75
4 by 1½	4.0	1.5	.625	2.75
5 by 1½*	5.0	1.5	.625	3.75
6 by 1½*	6.0	1.5	.625	4.75
8 by 1½*	8.0	1.5	.625	6.75
6 by 1¾	6.0	1.75	.75	4.5
7 by 1¾	7.0	1.75	.75	5.5
8 by 1¾	8.0	1.75	.75	6.5
6 by 2†	6.0	2.0	.875	4.25
7 by 2†	7.0	2.0	.875	5.25
8 by 2†	8.0	2.0	.875	6.25
9 by 2†	9.0	2.0	.875	7.25
10 by 2†	10.0	2.0	.875	8.25
6 by 2½	6.0	2.5	1.0	4.0
7 by 2½	7.0	2.5	1.0	5.0
8 by 2½	8.0	2.5	1.0	6.0
9 by 2½	9.0	2.5	1.0	7.0
10 by 2½	10.0	2.5	1.0	8.0
11 by 2½	11.0	2.5	1.0	9.0
12 by 2½	12.0	2.5	1.0	10.0
14 by 2½	14.0	2.5	1.0	12.0
16 by 2½	16.0	2.5	1.0	14.0
18 by 2½	18.0	2.5	1.0	16.0
5 by 3	5.0	3.0	1.0	3.0
6 by 3	6.0	3.0	1.0	4.0
7 by 3	7.0	3.0	1.0	5.0
9 by 3	9.0	3.0	1.0	7.0
10 by 3	10.0	3.0	1.0	8.0
12 by 3	12.0	3.0	1.0	10.0
14 by 3	14.0	3.0	1.0	12.0
16 by 3	16.0	3.0	1.0	14.0
18 by 3	18.0	3.0	1.0	16.0
12 by 3½	12.0	3.5	1.0	10.0
5¾ by 4	5.75	4.0	.5	4.75
6½ by 4	6.50	4.0	.75	5.00
8 by 4	8.0	4.0	1.00	6.00
12 by 4	12.0	4.0	1.00	10.00
5½ by 4½	5.5	4.5	1.0	3.5
6½ by 4½	6.5	4.5	1.0	4.5
6 by 5	6.0	5.0	.75	4.5
6½ by 5	6.5	5.0	1.0	4.5

*Present height, 0.75-inch. (See note below.)

†Present height, 1.00-inch. (See note below.)

NOTE: It is understood that dimensions in table should be followed for equipment for any new diameters and in case of replacement of equipment in existing sizes. "A" diameters remain constant, but "B" diameters vary inversely with sectional height.

Tolerances { Width, plus 0; minus 0.031-inch. { Wheel, O. D., plus 0; minus 0.062-inch.

[1] Simplified Practice Recommendation R-103-33 for Industrial Truck and Trailer Solid Tires. Supersedes R-103-29. Promulgated by the National Bureau of Standards, Washington, D. C.

Rims Approved by THE Tire & Rim Association, Inc.

Rim Size	3 Mos., 1935 No.	3 Mos., 1935 %	3 Mos., 1934 No.	3 Mos., 1934 %
Drop Center, 16" diam. & under				
15x5.50E	.....	...	2,314	0.1
16x4.00D	772,820	14.8	497,504	13.4
16x4.25D	524,794	10.1	257,730	6.9
16x4.50D	134,706	2.6	148,729	4.0
16x5.00E	13,123	0.3	27	0.0
16x5.50E	7,419	0.1	.....	...
15x5.50F	4,576	0.1	.....	...
16x4.00E	844,982	16.2	30,188	0.8
16x4.50E	715,301	13.7	287,940	7.8
16x5.00F	26,985	0.5	96,656	2.6
16x5.50F	834	0.0	17,085	0.5
Drop Center, 17" diam. & over				
17x3.00D	526,381	10.1	244,250	6.6
17x3.25E	165,143	3.2	223,163	6.0
17x3.62F	331,392	6.4	863,683	23.3
17x4.00F	20,800	0.4	20,273	0.5
17x4.19F	11,639	0.2	3,903	0.1
18x2.15B	5,897	0.1	5,822	0.2
18x3.00D	7,925	0.1	2,887	0.1
18x3.25E	1,295	0.0	10,522	0.3
18x4.00F	21	0.0	924	0.0
18x4.19F	2,639	0.0	5,966	0.2
19x2.15B	5,880	0.1	2,097	0.1
19x3.00D	2,589	0.0	19,436	0.5
19x3.25E	4,166	0.1	.....	...
20x3.25E	2,807	0.1	.....	...
21x3.25E	.....	...	3,645	0.1
Flat Base				
17x5	5,228	0.1	1,513	0.0
17x6	799	0.0	.....	0.0
18x3.25E	.....	...	477	0.0
18x4	148	0.0	1,282	0.0
18x5	542	0.0	755	0.0
19x2.75D	1,260	0.0	1,016	0.0
19x3.00D	646	0.0	565	0.0
19x4	1,507	0.0	3,322	0.1
19x4½	313	0.0	260	0.0
19x5	88	0.0	392	0.0
20x2.75D	124	0.0	5,006	0.1
20x3½	2,098	0.0	652	0.0
20x4	347	0.0	605	0.0
20x4½	1,419	0.0	745	0.0
20x5	6,517	0.1	10,398	0.3
20x6	107	0.0	919	0.0
21x2.75D	226	0.0	.....	...
21x3½	3,126	0.1	6,988	0.2
21x4	321	0.0	425	0.0
21x4½	1,457	0.0	.....	...
21x6	.....	...	358	0.0
High Pressure				
30x3½	228	0.0	1,509	0.0
32x4	.....	...	205	0.0
32x4½	.....	...	507	0.0
34x4½	.....	...	208	0.0
18" Truck				
18x6	164	0.0	79	0.0
18x7	9,379	0.1	5,522	0.2
18x8	677	0.0	393	0.0
20" Truck				
20x5	529,201	10.2	598,643	16.1
20x6	387,610	7.4	216,180	5.9
20x7	46,977	0.9	53,711	1.4
20x8	28,074	0.5	15,458	0.4
20x9/10	3,526	0.1	1,948	0.1
20x10.50	.....	...	299	0.0
20x11	348	0.0	129	0.0
22" Truck				
22x7	620	0.0	66	0.0
22x8	3,959	0.1	3,217	0.1
22x9/10	3,457	0.1	1,305	0.0
24" Truck				
24x5	.....	...	10	0.0
24x6	867	0.0	2,437	0.1
24x7	2,071	0.0	3,031	0.1
24x8	5,782	0.1	4,080	0.1
24x9/10	1,572	0.0	2,184	0.1
24x11	366	0.0	209	0.0
Drop Center Tractor				
24x6.00S	559	0.0	2,641	0.1
24x8.00T	8,683	0.2	4,307	0.1
28x8.00T	2,356	0.0	662	0.0
36x6.00S	10,096	0.2	2,334	0.1
36x8.00T	252	0.0	.....	...
Airplane				
12x3	807	0.0	.....	...
44x10	10	0.0	.....	...
Clincher, Motorcycle				
24x3	249	0.0	134	0.0
Clincher, Automobile				
30x3½	921	0.0	1,303	0.0
Totals	5,209,198	...	3,703,133	...

Tire Production Statistics

Pneumatic Casings—All Types

	Inventory	Production	Total Shipments
1932	6,115,487	32,067,732	32,200,820
1933	7,110,456	36,243,384	35,274,970
1934	9,171,335	45,815,763	45,285,955
1935			
Jan.	10,085,737	4,487,679	3,552,737
Feb.	11,183,674	4,251,183	3,188,772

Solid and Cushion Tires

1932	23,830	97,089	108,581
1933	26,271	130,987	126,990
1934	34,710	197,497	187,152
1935			
Jan.	31,581	21,510	20,300
Feb.	.....	17,657	16,183

Inner Tubes—All Types

1932	5,399,551	29,513,246	30,328,536
1933	6,251,941	34,044,689	33,112,472
1934	8,904,496	44,840,971	43,694,130
1935			
Jan.	9,332,489	4,131,004	3,610,371
Feb.	10,151,721	4,046,062	3,261,488

	Cotton and Rubber Consumption Casings, Tubes, Solid and Cushion Tires		Consumption of Motor Gasoline (100%) Gallons
	Cotton Fabric Pounds	Crude Rubber Pounds	
1932	128,981,222	416,577,533	15,703,800,000
1933	148,989,293	512,489,423	15,880,746,000
1934	196,069,495	697,558,218	17,063,298,000
1935			
Jan.	19,607,932	72,968,356	1,178,604,000
Feb.	18,058,726	66,463,131	1,133,378,000

Rubber Manufacturers Association, Inc., figures representing approximately 97% of the industry for 1934 and 1935 and 80% for previous years, with the exception of gasoline consumption.

BROCKTON TOOL COMPANY

103 BELMONT STREET QUALITY HEEL MOULDS BROCKTON, MASS.

MOULDS FOR BAKELITE—HARD RUBBER—MECHANICAL GOODS—RUBBER SOLES

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Best Advertising Effects for all wishing to pick up Trade Connections with Germany in this field

Rubber Goods Production Statistics

		1935	1934
TIRES AND TUBES*		Jan.	Jan.
Pneumatic casings			
Production	thousands	4,488	3,804
Shipments, total	thousands	3,553	3,126
Domestic	thousands	3,469	3,043
Stocks, end of month	thousands	10,086	9,394
Solid and cushion tires			
Production	thousands	22	14
Shipments, total	thousands	20	14
Domestic	thousands	20	13
Stocks, end of month	thousands	32	30
Inner tubes			
Production	thousands	4,131	3,445
Shipments, total	thousands	3,610	3,103
Domestic	thousands	3,539	3,045
Stocks, end of month	thousands	9,332	8,151
Raw material consumed			
Fabrics	thous. of lbs.	19,608	16,437
MISCELLANEOUS PRODUCTS			
Rubber bands, shipments	thous. of lbs.	230	303
Rubber clothing, calendered			
Orders, net	no. of coats and sundries	†	13,811
Production	no. of coats and sundries	†	21,777
Rubber-proofed fabrics, production, total	thous. of yds.	3,776	2,488
Auto fabrics	thous. of yds.	286	257
Raincoat fabrics	thous. of yds.	1,141	939
Rubber flooring, shipments	thous. of sq. ft.	268	310
Rubber and canvas footwear			
Production, total	thous. of prs.	5,668	6,247
Tennis	thous. of prs.	2,668	3,584
Waterproof	thous. of prs.	2,999	2,663
Shipments, total	thous. of prs.	6,379	7,231
Tennis	thous. of prs.	2,778	4,133
Waterproof	thous. of prs.	3,601	3,098
Shipments, domestic, total	thous. of prs.	6,250	7,207
Tennis	thous. of prs.	2,661	4,129
Waterproof	thous. of prs.	3,589	3,078
Stocks, total, end of month	thous. of prs.	14,466	15,583
Tennis	thous. of prs.	6,890	7,742
Waterproof	thous. of prs.	7,576	7,841
Rubber heels			
Production	thous. of prs.	14,351	14,826
Shipments, total	thous. of prs.	16,630	13,463
Export	thous. of prs.	296	432
Repair trade	thous. of prs.	5,667	2,833
Shoe manufactures	thous. of prs.	10,667	10,198
Stocks, end of month	thous. of prs.	35,811	42,587
Rubber soles			
Production	thous. of prs.	3,705	5,499
Shipments, total	thous. of prs.	3,696	5,594
Export	thous. of prs.	9	5
Repair trade	thous. of prs.	650	388
Shoe manufactures	thous. of prs.	3,037	5,201
Stocks, end of month	thous. of prs.	4,311	5,090
Mechanical rubber goods, shipments			
Total	thous. of dollars	4,515	3,479
Belting	thous. of dollars	871	699
Hose	thous. of dollars	1,430	1,297
Other	thous. of dollars	2,215	1,483

*Data for 1934 are estimated to represent approximately 97% of the industry. †Discontinued.

Source: *Survey of Current Business*, Bureau of Foreign & Domestic Commerce, Washington, D. C.

Foreign Trade Information

For further information concerning the inquiries listed below address United States Department of Commerce, Bureau of Foreign and Domestic Commerce, Room 734, Custom House, New York, N. Y.

No.	COMMODITY	CITY AND COUNTRY
†8,588	Rubber thread machinery	Amsterdam, Netherlands
*8,622	Automobile tubing	Wellington, New Zealand
†8,635	Wedge belting	Vienna, Austria
*8,652	Dentists' gutta percha in rods	Prague, Czechoslovakia
*8,654	Tires and tubes	Guayaquil, Ecuador
†8,656	Sanitary goods and plumbers' accessories	Habana, Cuba
†8,670	Rubberized materials and elastic for suspenders, corsets, etc.	Jerusalem, Palestine
†8,681	Tires	Caracas, Venezuela
†8,694	Belting and other industrial rubber goods	Lyon, France
‡8,700	Rubber goods	Paris, France
†8,735	Elastic fabrics	Toronto, Canada

*Purchase. †Agency. ‡Purchase or agency.

Net Exports of Latex and Latex Concentrates from Malaya, Netherlands East Indies, and Ceylon

(Dry rubber content)

Annual	Malaya	N.E.I.	Ceylon	Total
1925	3,618	2,239	6	5,863
1926	3,261	43	20	3,324
1927	2,634	83	0	2,717
1928	2,247	1,395	1	3,643
1929	3,574	1,437	2	5,013
1930	2,750	2,744	11	5,505
1931	1,940	3,874	2	5,816
1932	5,193	3,488	2	8,683
1933	10,470	5,260	1	15,731
1934	14,172	5,391	3	19,566
1934		*	†	
Jan.	875	314	0	1,189
Feb.	1,119	393	0	1,512
Mar.	1,331	420	0	1,751
Apr.	1,147	467	0	1,614
May	1,577	662	0	2,239
June	1,131	431	0	1,562
July	1,261	741	1	2,003
Aug.	1,087	379	0	1,466
Sept.	1,097	418	0	1,515
Oct.	1,324	287	0	1,611
Nov.	1,059	289	1	1,349
Dec.	1,164	590	1	1,755
Year	14,172	5,391	3	19,566
1935				
Jan.	1,043	231	2	1,276
Feb.	987	...	2	....

*Dry rubber content from January, to May, 1934, is estimated at 35% of the gross weight, and thereafter as officially reported.

†Monthly quantities are negligible. Exports are placed against the month in which the cumulative amounted to over one-half ton.

Source: *Statistical Bulletin of the International Rubber Regulation Committee.*

U. S. Crude and Waste Rubber Imports for 1935

	Plantations	Latex	Paras	Africans	Centrals	Guayule	Manicoba and Matto Grosso	Totals 1935	Totals 1934	Balata	Miscellaneous	Waste
Jan. ....tons	41,188	599	201	30	41	..	..	42,059	46,204	26	553	..
Feb.	33,722	388	1,208	14	51	..	..	35,383	31,032	73	194	29
Mar.	42,373	967	513	167	21	..	..	44,041	44,605	55	659	40
Total, 3 mos., 1935 ....tons	117,283	1,954	1,922	211	113	..	..	121,483	.....	154	1,406	69
Total, 3 mos., 1934 ....tons	118,356	2,624	750	61	..	50	..	.....	121,841	312	1,715	189

Compiled from The Rubber Manufacturers Association, Inc., statistics.

United States Latex Imports

Year	Pounds	Value
1931	10,414,712	$884,355
1932	11,388,156	601,999
1933	24,829,861	1,833,671
1934	29,276,134	3,633,253
1935		
Jan.	1,898,962	297,583
Feb.	1,282,941	179,583

Data from United States Department of Commerce, Washington, D. C.

World Net Imports of Crude Rubber

Year	U.S.A.	U.K.	Australia	Belgium	Canada	Central Europe	France	Germany	Italy	Japan	Russia	Rest of the World	Total
1925	385,500	4,900	4,500	2,900	19,800	4,800	34,300	33,900	11,400	12,900	7,500	6,800	529,200
1926	399,900	84,900	9,000	2,500	20,200	5,100	35,700	22,800	9,800	18,300	7,000	8,000	623,200
1927	403,400	59,800	9,500	6,500	26,400	8,200	35,700	38,900	11,300	20,500	14,000	7,900	642,100
1928	407,500	4,400	8,400	7,900	30,900	10,000	38,000	37,900	12,400	25,800	8,000	12,000	603,200
1929	528,600	122,800	15,900	9,400	35,500	13,900	61,800	49,100	16,400	34,300	12,700	16,400	916,800
1930	457,400	120,000	5,400	10,700	28,800	12,100	71,400	45,800	18,600	33,000	16,700	18,700	838,600
1931	476,200	85,200	7,700	11,000	25,300	15,200	47,800	39,200	10,100	43,500	30,700	20,600	812,500
1932	393,800	43,500	12,400	9,500	20,900	15,800	41,700	45,000	15,300	56,100	30,000	25,600	709,600
1933	398,400	73,300	13,500	11,200	19,300	18,900	63,100	54,100	19,300	66,900	30,800	28,300	797,100
1934	438,941	158,481	9,642	9,116	28,439	23,427	50,405	59,330	21,403	69,934	45,312	38,166	952,596
1935													
Jan.	39,546	20,383	1,099	419	2,670	2,116	5,500*	4,286	1,648	4,402	3,200*	3,260*	88,529
Feb.	.....	15,609	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

* Estimate. Source: *Statistical Bulletin of the International Rubber Regulation Committee.*

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Automatically synchronizes the latex and the air by a single adjustment. Changes in width of spray (from a dot to a 6-inch fan) can be made *while gun is in operation.* A fine tool at little cost.

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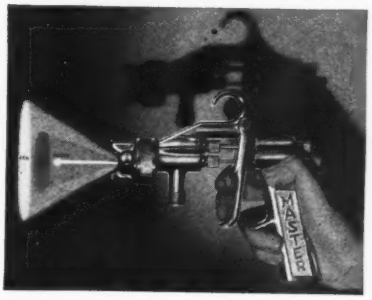

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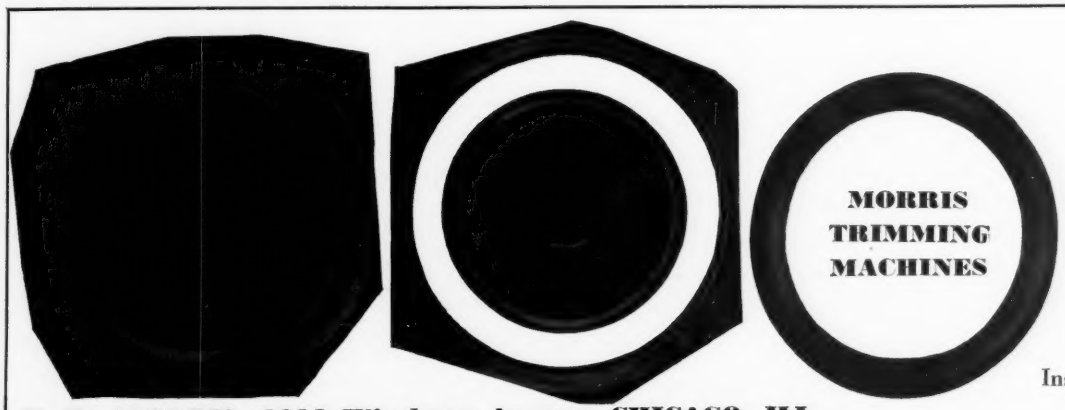


The World's Trimmers

RING

Before and after trimming. Inside, outside.

T. W. MORRIS, 6312 Winthrop Avenue, CHICAGO, ILL.

United States Statistics

Imports for Consumption of Crude and Manufactured Rubber

	January, 1934		January, 1935	
UNMANUFACTURED—*Free*	Pounds	Value	Pounds	Value
Crude rubber	107,436,221	$7,403,123	88,873,028	$10,852,308
Liquid latex	2,521,961	239,054	1,898,962	287,583
Jelutong or pontianak	1,716,305	169,966	1,002,494	80,097
Balata	220,409	43,932	180,525	34,867
Gutta percha	135,520	11,672	832,204	117,138
Guayule	.....	.....	.....	.....
Scrap and reclaimed, etc.	603,022	2,966	354,873	5,148
Totals	112,633,438	$7,870,713	93,142,086	$11,377,141
Chicle, crude *Free*	643,859	$141,897	1,483,175	$328,449
MANUFACTURED—*Dutiable*				
Rubber soled footwear with fabric uppers *pairs*	210,352	$53,873	79,770	$42,140
Rubber toys	.....	28,587	174,491	23,442
Druggists' sundries, n. e. s.	.....	6,805	.....	10,301
Combs, hard rubber *number*	127,008	5,126	40,752	2,559
Golf balls *number*	4,128	1,058	13,320	2,473
Tennis and other rubber balls *number*	30,192	2,741	545,428	6,988
Tires *number*	313	1,046	882	941
Other rubber manufactures	.....	34,491	.....	27,450
Totals	.....	$133,727	.....	$116,294

Exports of Foreign Merchandise

RUBBER AND MANUFACTURES				
Crude rubber	4,423,763	$352,116	2,188,224	$278,229
Balata	11,097	2,025	24,978	6,595
Guayule	.....	.....	.....	.....
Gutta percha, rubber substitutes, and scrap	.....	.....	.....	.....
Rubber manufactures	.....	1,351	.....	4,338
Totals	.....	$355,492	.....	$289,162

Exports of Domestic Merchandise

RUBBER AND MANUFACTURES				
Reclaimed	745,105	$35,485	1,157,842	$55,579
Scrap	3,478,119	72,855	5,103,061	61,433
Rubberized automobile cloth, *sq. yd.*	65,234	31,691	38,987	21,140
Other rubberized piece goods and hospital sheeting *sq. yd.*	38,755	16,616	104,661	28,587
Footwear				
Boots *pairs*	8,690	21,297	5,384	11,085
Shoes *pairs*	20,451	13,714	3,240	2,608
Canvas shoes with rubber soles *pairs*	4,236	3,504	39,341	22,228
Soles *doz. pairs*	3,834	5,886	2,010	3,094
Heels *doz. pairs*	24,236	12,213	35,822	23,406
Soling and top lift sheets	.....	.....	16,227	2,362
Water bottles and fountain syringes *number*	12,618	5,062	13,237	4,985
Gloves *doz. pairs*	4,204	7,966	5,184	11,184
Other druggists' sundries	.....	28,607	.....	25,148
Balloons *gross*	25,048	22,674	27,123	21,524
Toys and balls	.....	2,674	.....	3,009
Bathing caps *doz.*	9,577	14,508	3,862	4,855
Bands	18,716	5,608	15,797	5,428
Erasers	15,551	7,678	24,239	14,867
Hard rubber goods				
Electrical goods	72,163	7,871	137,254	13,283
Other goods	.....	8,569	.....	18,290
Tires				
Truck and bus casings, *number*	14,905	232,595	23,265	375,952
Other automobile casings, *number*	64,803	455,942	70,309	544,612
Tubes, auto *number*	52,462	55,075	63,574	77,934
Other casings and tubes, *number*	1,328	3,170	4,898	11,707
Solid tires for automobiles and motor trucks *number*	626	18,053	701	21,035
Other solid tires	147,472	17,084	115,558	15,324
Tire sundries and repair materials	.....	30,663	.....	28,548
Rubber and friction tape	46,466	11,077	53,383	14,574
Belting	166,449	75,361	172,098	93,177
Hose	301,920	87,036	299,673	82,688
Packing	89,619	40,790	127,082	44,072
Thread	108,584	61,221	94,008	58,532
Other rubber manufactures	.....	69,815	.....	150,086
Totals	.....	$1,482,360	.....	$1,872,336

London Stocks, February, 1935

			Stocks, February 28		
LONDON	Landed Tons	Delivered Tons	1935 Tons	1934 Tons	1933 Tons
Plantation	10,019	4,236	87,527	39,728	37,127
Other grades	33	18	78	24	55
LIVERPOOL					
Plantation	*2,941	*1,363	*67,983	*52,730	*52,990
Total tons, London and Liverpool	12,993	5,617	155,588	92,482	90,172

*Official returns from the recognized public warehouses.

Dominion of Canada Statistics

Imports of Crude and Manufactured Rubber

	Twelve Months Ended December, 1933		Twelve Months Ended December, 1934	
UNMANUFACTURED	Pounds	Value	Pounds	Value
Crude rubber, etc.	43,281,821	$2,739,305	63,701,489	$7,553,651
Gutta percha	6,858	6,421	15,893	10,893
Rubber, recovered	5,182,200	201,828	6,665,200	293,074
Rubber, powdered, and gutta percha scrap	2,349,900	38,418	2,998,700	55,455
Balata	11,448	5,470	21,904	7,931
Rubber substitute	201,200	41,245	393,300	97,890
Totals	51,033,427	$3,032,687	73,796,486	$8,018,894
PARTLY MANUFACTURED				
Hard rubber sheets and rods	68,312	$15,726	20,340	$11,572
Hard rubber tubes	.....	5,843	.....	7,470
Rubber thread not covered	118,488	99,767	64,955	48,445
Totals	186,800	$121,336	85,295	$67,487
MANUFACTURED				
Belting	.....	$43,425	.....	$65,625
Hose	.....	46,297	.....	68,614
Packing	.....	40,711	.....	51,691
Boots and shoes *pairs*	674,143	225,681	1,109,370	438,805
Clothing, including waterproofed	.....	10,620	.....	20,462
Raincoats *number*	12,046	36,136	12,566	36,764
Gloves *dozen pairs*	.....	7,124	3,643	8,600
Hot water bottles	.....	17,660	.....	18,614
Tires, bicycle *number*	23,899	11,416	37,579	16,010
Pneumatic *number*	16,454	132,830	15,829	174,815
Inner tubes *number*	1,860	4,653	4,004	9,218
Solid for automobiles and motor trucks *number*	260	8,264	443	17,457
Other solid tires	.....	8,256	.....	5,149
Mats and matting	.....	39,119	.....	68,106
Cement	.....	66,128	.....	84,882
Golf balls *dozen*	32,820	93,265	27,019	77,931
Heels *pairs*	93,786	3,659	86,249	5,951
Other rubber manufactures	.....	600,445	.....	713,248
Totals	.....	$1,395,689	.....	$1,881,942
Totals, rubber imports	.....	$4,549,712	.....	$9,968,323

Exports of Domestic and Foreign Rubber Goods

UNMANUFACTURED	Produce of Canada Value	Reexports of Foreign Goods Value	Produce of Canada Value	Reexports of Foreign Goods Value
Waste rubber	$40,278	.....	$66,412	.....
MANUFACTURED				
Belting	$229,892	.....	$445,975	.....
Canvas shoes with rubber soles	736,755	.....	1,579,008	.....
Boots and shoes	2,043,490	.....	1,989,550	.....
Clothing, including waterproofed	72,312	.....	130,729	.....
Heels	174,627	.....	161,261	.....
Hose	72,899	.....	176,663	.....
Soles	204,583	.....	245,479	.....
Tires, bicycle	94	.....	84	.....
Pneumatic	3,336,069	.....	6,065,865	.....
Inner tubes	245,436	.....	471,768	.....
Solid	.....	.....	127	.....
Other rubber manufactures	488,001	$15,935	657,230	$18,482
Totals	$7,604,158	$15,935	$11,923,739	$18,482
Totals, rubber exports	$7,644,436	$15,935	$11,990,151	$18,482

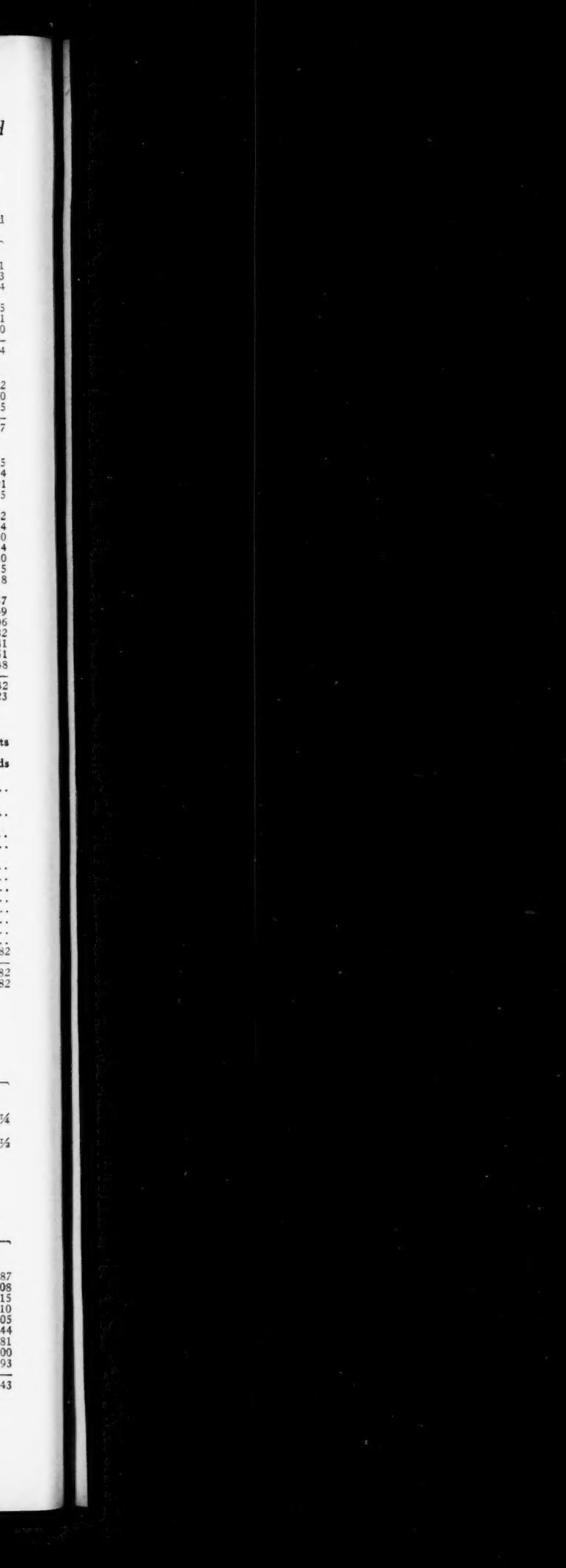
Low and High New York Spot Prices

All prices in cents per pound

	1935*	April 1934	April 1933
PLANTATIONS			
No. 1 thin latex crepe	10⅞/12¼	13⅛/15¾	3¾/5
No. 1 ribbed smoked sheet	10⅛/12	11¼/13⅜	2⅛/4¼
PARAS			
Upriver fine	8¾/ 9½	10¼/11	6 /6½

*Figured to April 26, 1935.

Imports by Customs Districts

	February, 1935 *Crude Rubber Pounds	February, 1935 *Crude Rubber Value	February, 1934 *Crude Rubber Pounds	February, 1934 *Crude Rubber Value
Massachusetts	5,988,455	$746,695	5,870,633	$438,287
New York	91,656,132	10,594,204	62,085,467	4,259,108
Philadelphia	1,888,960	221,208	2,496,611	164,315
Maryland	260,377	29,992	4,390,093	298,010
New Orleans	1,036,527	104,101	712,018	57,205
Los Angeles	6,069,574	741,184	2,706,935	193,544
San Francisco	224,000	28,293	144,900	11,781
Ohio	46,845	5,148	150,175	12,200
Colorado	.....	.....	336,000	21,993
Totals	107,170,870	$12,470,825	78,892,832	$5,456,443

*Crude rubber including latex dry rubber content.